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The Use of Waking and Hypnotic Suggestions to Change Behavior

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Submitted in Partial Fulfillment of
the Requirements for the Degree
of Doctor of Philosophy
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"Grant me serenity to accept that which
cannot be changed, courage to change
that which can and should be changed,
and wisdom to know the difference."

Saint Francis of Assissi

Abstract

Three experiments were performed. The first indicated that hypnotic procedures can be used to facilitate partial extinction of a previously learned habit such as cigarette smoking, and it suggested that the effects of hypnosis are more than a function of the experimental demands and social pressures inherent in the typical hypnotic setting. It also indicated that the Harvard Group Scale of Hypnotic Susceptibility can serve as a predictor of "long term" behavioral change.

The second experiment showed that both waking and hypnotic suggestions can cause development of a new habit (i.e., eating life saver candies). Hypnotic procedures were more effective than waking procedures in instituting that habit but this difference was not reflected in its persistence. Both affective and cognitive instructions proved capable of initiating development of this new response. An attempted reinforcement procedure was not successful.

The third experiment showed that experiencing hypnotically induced emotions at the time that opinions are being formed, in this case concerning a musical selection, can affect what those opinions will be and that study also demonstrated one way in which cognitive information can interact with emotions to help determine behavior.

Chapter 1

INTRODUCTION

Ever since the late seventeen hundreds when hypnosis was first used by Mesmer (1779) controversy has existed about the effectiveness of hypnotic techniques. Today, almost two hundred years later that controversy still remains essentially unresolved. Although numerous claims continue to be advanced to the effect that induction of a hypnotic "trance state" markedly facilitates achievement of various types of behavioral and psychological changes (Kroger, 1969; LeCron, 1952; Wallace, 1970), remarkably few well controlled studies have been conducted in which accurate quantitative analysis of such contentions have been made.

Although most researchers acknowledge that marked behavioral changes can take place within the typical hypnotic setting, disagreement exists about how these can be most meaningfully explained (Chaves, 1968). In addition, from a therapeutic point of view, relatively little accurate information is available about the permanence associated with such changes.

One purpose of the present thesis will be to isolate experimentally several variables that could be responsible for bringing about the kinds of behavioral changes typically observed when hypnotic suggestions are employed. A second purpose will

be to examine the length of time for which such changes persist. Finally, an effort will be made to examine the possibility that certain hypnotically induced behavioral changes can be accounted for in terms of interaction between an individual's emotions and his thought processes. To carry out the above objectives the results of three experiments will be reviewed.

The initial experiment was intended to answer several questions. First, an attempt was made to determine whether the types of changes brought about when hypnosis is employed are a specific function of the "trance state" itself, or whether they can be accounted for by other variables.

Barber (1967) has pointed out in this connection that whenever hypnotic procedures are employed there are several variables present capable of contributing to behavioral modification. These factors, which, theoretically, could exert a behavioral effect independent of any "trance" related changes can be classified as "subject variables", "interpersonal variables", and "experimenter variables".

Examples of "subject variables" would be differences which exist in hypnotic susceptibility and suggestibility among individual persons; their expectations; their individual motivations, interests, and attitudes; and their private conceptions of the therapeutic or experimental situation. The "interpersonal variables" would be a function of other factors such as the amount of time

and attention accorded each subject by the experimenter or hypnotist, the relationships which exist among the subjects and the hypnotist, the inferred demands or social pressures placed by the experimenter upon the subjects (Orne, 1962), and the amount of preliminary training administered each subject. The "experimenter variables" would include such factors as the wording and intonation used by the hypnotist, as well as his facial expressions, gestures, elocution, implied biases, and so on.

Barber (1969) also stresses the importance of the role played by "procedural variables" in the typical hypnotic experiment. These include elements of all three classes of variables listed above. He notes in this connection that in many experiments involving hypnosis the hypnotic group is often lead to expect that it will be able to perform well in carrying out instructed acts simply by virtue of the fact that the situation they are in has been defined to them as one involving hypnosis. In contrast, the control treatment is often defined explicitly or implicitly as an ordinary situation in which the subject is not expected to perform well in response to the experimenter's suggestions.

Although one can never be absolutely certain that all subjects' expectations have been equated, Barber suggests that one must define the experimental situation similarly to both the hypnotic and waking groups in order to try to eliminate any preconceived biases that the subjects in each group may have about the way in which they expect themselves to be able to perform.

One goal of the first study was to hold constant across experimental conditions variables of the type referred to above so as to determine whether behavioral differences would still materialize among those conditions as a function of the presence, or absence, of the "trance state" itself.

The first study was intended to play another role as well. It has been shown that persons differ from one another in their responsiveness to hypnotic suggestions when such suggestions involve the performance of a fairly immediate response (Hilgard, 1967), and several tests have been developed to assess the degree to which such differences exist (eg., Weitzenhoffer & Hilgard, 1962). Very few studies have been published, however, which have measured the effectiveness of such tests as predictors of behavioral change extending over a period of several weeks. Therefore, the first investigation also attempted to determine whether it would be possible to determine in advance those individuals who would be most responsive to long term behavioral changes instituted by hypnotic procedures.

The behavior examined in the first experiment was cigarette smoking, and the experiment was intended to provide an indication of the efficacy of hypnotic suggestions in bringing about the partial extinction of such a persistent habit.

The second experiment demonstrated the use of hypnosis in initiating the development of a new habit and explored the possibility that once such a hypnotically induced habit had been acquired an individual would experience some difficulty in attempting to eliminate it.

Any habit may or may not be emotionally mediated (Mandler, 1967), as well as being a function of associative (eg., cognitive or reflexive) involvement (Bronowski & Bellugi, 1970). Therefore, the second study attempted to isolate the contribution made to habit formation by hypnotic instructions that either suggest or fail to suggest to a subject that he will experience emotional arousal. This study also examined the feasibility of employing posthypnotic suggestions to reinforce the instructions originally presented to the experimental subjects.

After examining in the first two studies some of the variables that can contribute to hypnotic induction and elimination of habits, the third experiment was designed to look in greater depth at the question of whether hypnotically induced emotions can play a role in affecting more global types of behaviors than those previously considered. This investigation attempted to determine whether hypnotic procedures could be employed to study the psychological dynamics of attitude change. The intent was to find out if hypnotically induced and conditioned emotions could be used to influence an individual's opinions and to see if such opinions would be more markedly affected if that individual did not cognitively realize that his feelings were a function of hypnotic instructions (Schachter & Singer, 1962).

Finally, it should be noted that from a practical point of view all three studies were considered important in terms of the implications they generated about the possibility of using hypnotic techniques to affect emotional change. Such implications

were considered important since many human behaviors undoubtedly occur in response to feelings which are involuntarily aroused rather than because an individual intellectually thinks he should perform in such a fashion.

In reviewing these experiments it will be pointed out that barring the existence of certain biophysical conditions, hypnotic techniques may be able to provide a means whereby an individual can learn to control his emotions and to feel the way he says he wants to feel. If this is indeed the case, it may be that hypnotic techniques will once again come into more prevalent use as therapeutic aids (Luce & Segal, 1966; Coyne, 1968; London, 1969; Marcuse, 1959; Hoskovec, 1967). Such a possibility, along with some theoretical limitations, will be further discussed at the conclusion of this thesis.

Chapter 2

EXPERIMENT 1

Introduction

This first experiment was designed to test the possibility of using hypnosis in order to facilitate the extinction of a previously acquired habit. In the past several experimenters who have utilized hypnotic techniques have reported success in achieving various behavioral changes, some of which purportedly extended over periods of two years or more (Ejrup, 1964; Edwards, 1964; Lawton, 1967). Many of these studies have been criticized, however, on the basis of serious shortcomings in their control and followup procedures (Bernstein, 1969).

In many studies the experimenter spent considerably more time with the hypnotic subjects than with the control groups (Graff, Hammett, & Bash, 1966). Such a condition makes it difficult to attribute the observed behavioral changes to the presence of the "trance state" alone. In several experiments (eg., Cruickshank, 1963) highly suggestible subjects were used in the hypnotic groups whereas subjects who could not be readily hypnotized were relegated to the control conditions. This, too, has undoubtedly biased the results of some investigations.

In some studies, particularly those carried out within a therapeutic setting (eg., Erickson, 1964; Wolberg, 1964),

hypnosis has been used by Freudian analysts as an adjunct to their therapeutic procedures. These efforts, although claiming varying degrees of success (Rhodes, 1952; Clawson, 1964; Gill & Brenman, 1963), have frequently failed to include proper controls.

Thus, the present investigations have been designed to control the selection of subjects, the treatment procedures accorded each subject, and the followup techniques. To achieve such a standard in the first investigation, cigarette smoking was selected as the behavior to be altered. This was done because smoking represents a discrete observable response pattern which can be readily quantified.

Because an immediate and total reduction in the number of cigarettes smoked might have obscured subsequent comparisons among the control procedures the first experiment could not be designed to test the possibility of using hypnosis in helping subjects <u>completely</u> break the smoking habit. In addition, for the reasons discussed above, experimenter-subject interactions had to be kept to a minimum.

Alterations in the frequency of smoking cigarettes can provide a good measure for testing and comparing the relative efficacy of various therapeutic methods which are designed to deal with the same types of clinical problems. If a therapeutic method is shown to be successful in its ability to help eliminate a discrete problem such as excessive cigarette smoking then

conceiveably that method might facilitate treating addictions other than smoking. Of course, the reverse is also true in that if a method is incapable of dealing with a relatively discrete habit such as cigarette smoking it is difficult to see how such a procedure could be effective in dealing with similar but more severe problems.

Two recent reviews (Bernstein, 1969; Keutzer & Lichtenstein, 1968) summarize the results of several studies that have made use of various treatment methods including psychoanalysis, group support, behavior therapy, lobeline sulfate administration, and hypnosis as means of trying to help persons overcome the smoking habit. Virtually all of these efforts (eg., Lichtenstein, Keutzer & Himes, 1969) have achieved only very limited and temporary success.

Additional research in this area has been reported by Poverinski (1961), Moses (1964), vonDedenroth (1964), Johnson (1970), Resnick (1968), and Berecz (1970).

Method

Preliminary Selection of Subjects

All subjects used in the three experiments reported here were students from two large undergraduate psychology classes at Dalhousie University. The Harvard Group Scale of Hypnotic

Susceptibility (HGS test) was administered once to each class as a whole, the object being to secure a pool of subjects from which the actual experimental subjects could be drawn.

The HGS test is a simple twelve point self-rating scale which can be administered to groups of any size. A sample of the type of item contained in it is the "Finger Lock" instruction. Here subjects who have already been given a set of hypnotic induction instructions are asked to interlock the fingers of their two hands together. They are then told that they will not be able to pull their hands apart. Next, they are allowed ten seconds in which to try to pull their hands apart. Those subjects who fail to do so pass that item.

In the present experiment the HGS test was administered as follows. Subsequent to the presentation of a few brief introductory comments that paraphrased the preliminary remarks suggested in the "Form A" manual (Shor & Orne, 1962) all of the HGS test instructions, including those pertaining to the hypnotic induction procedure, were administered from a tape recording made by the experimenter. This was the only formal contact that the experimenter had with any of the subjects either before or after their experimental sessions.

The results of the HGS test are shown in Table 1. In accord with Shore and Orne's (1963) recommendations, values of 8 and above have been labeled as <u>high</u> susceptibility scores;

values of 5, 6, and 7 as medium susceptibility scores; and values ranging from 0 to 4 as low susceptibility scores.

Table 1

Results of the HGS Test

Susceptibility	HGS Score	Class #1	Class #2	Total	%
Low	0	27	4	31	42
	1	15	6	21	
	2	33	6	39	
	3	61	8	69	
	4	29	10	39	29
Medium	5	53	11	64	
	6	28	8	36	
	7	32	7	39	
High	8	52	10	62	29
	9	26	2	28	
	10	25	4	29	
	11	13	3	16	
	12	5	0	5	

Note. - Class #1 was an introductory psychology course (N = 399). Class #2 was an intermediary level course (N = 79). The values listed beneath each class refer to the number of students who received a particular HGS score.

Subjects

Thirty subjects, all of whom had indicated on their HGS forms that they were cigarette smokers, were involved in the first experiment. These subjects were selected independent of factors such as age, sex, IQ, and so on. Fifteen subjects were randomly selected from the pool of low susceptibility scores, and the other fifteen were randomly selected from the pool of high susceptibility scores.

Each of the thirty subjects was instructed to keep an accurate record of the number of cigarettes he smoked each day for a period extending from thirty days prior to the date of his scheduled experimental session to thirty days afterwards. Individual record sheets were made available for this purpose. These were to be returned to the experimenter through the mail at the conclusion of the sixty-day time period.

Although Bernstien (1969) has criticized such self report techniques, there is evidence which suggests they can be quite accurate (Hoinville & Biggs, 1966; Todd & Laws, 1959), and that even under experimental conditions, validity and reliability coefficients are extremely high (Ober, 1966; Thompson & Wilson, 1966).

Procedure

Following selection, each subject was randomly assigned to one of six experimental conditions according to whether he was a highly susceptible subject who was to receive hypnotic instructions (hyp.-high), a low susceptibility subject who was to receive hypnotic instructions (hyp.-low), a highly susceptible subject who was to receive waking instructions (wake-high), a low susceptibility subject who was to receive waking instructions (wake-low), a highly susceptible subject who was not to receive any experimental instructions (control-high), or a low susceptibility subject who was not to receive any experimental instructions (control-low).

Table 2, below, schematically depicts the design of the present study.

Table 2

Design of Experiment 1

Type of Treatment	Type of Subjects	Subjects	Pre-treatment Days (1-30)	Post-Treatment Days (31-60)
Hypnotic Instructions	Highly Susceptible	1		
		2		
		3		
		4		
		5		
	Low Susceptibility	1		
		2		
		3		
		4		
		5		
No Instructions	Highly Susceptible	1		
		2		
		3		
		4		
		5		
	Low Susceptibility	1		
		2		
		3		
		4		
		5		
Waking Instructions	Highly Susceptible	1		
		2		
		3		
		4		
		5		
	Low Susceptibility	1		
		2		
		3		
		4		
		5		

The subjects in this experiment were seen in groups of either two or three. When a subject entered the experimental room

he was seated and made comfortable. He was then informed that all the instructions he was going to receive would be presented on a tape recording. This was to insure that each person would be exposed to exactly the same set of suggestions under standard conditions. If any questions were raised, the experimenter told the subject to use his own judgement, indicating that he did not want to bias the results by anything he might say or imply. Leads from a small galvanic skin response meter (GSR meter) were then taped to two fingers of the left hands of those individuals from whom physiological recordings were to be obtained. The experimenter briefly explained that this procedure was being used to monitor the depth of hypnosis of some of the persons listening to the recording.

Subjects were then allowed five minutes in which to relax, and then the tape recorder was turned on. All of the instructions, including those used for hypnotic induction, those concerned with bringing about a reduction in cigarette smoking, those pertaining to the "awakening" of subjects, and a special set of instructions for members of the waking groups only were then presented by means of the tape recorder. The final directions of each session which were to remind the subjects to continue to record the numbers of cigarettes smoked throughout the thirty-day period immediately following treatment, and also reminding them to be sure to return their record forms, were not taped.

The subjects were asked by the experimenter not to discuss their treatment sessions amongst themselves. The length of any given experimental period was of approximately forty five minutes. The instructions pertaining directly to cigarette smoking required about six minutes to be delivered. Figure 1, below, is a sketch of the experimental room.

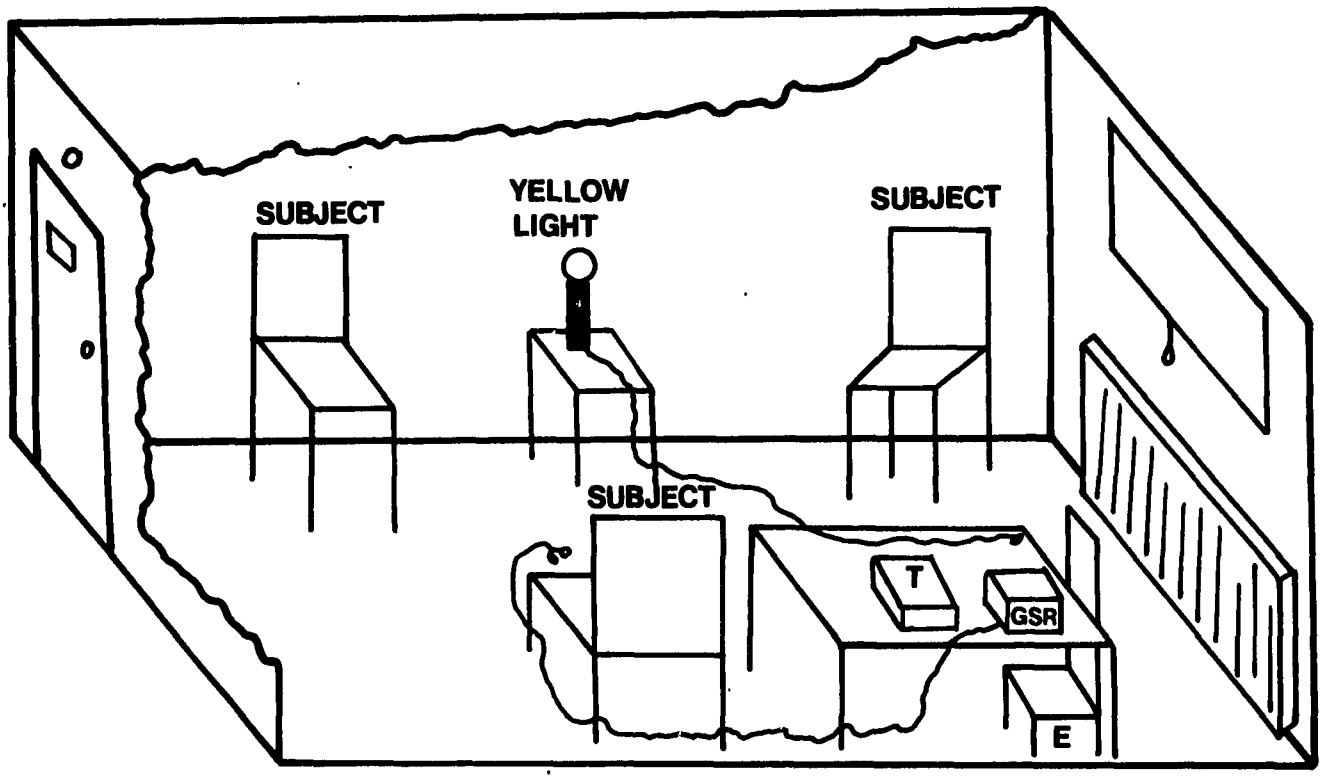

Figure 1. The experimental Room. (E=Experimenter T=Tape Recorder) (Yellow light for third experiment only).

The induction instructions themselves were an adaptation of a procedure developed by Weitzenhoffer (1957). Each subject

was simply required to sit quietly and to gaze at a spot on the ceiling above his head, while listening to the prerecorded suggestions. These required approximately twenty five minutes in which to be delivered. After the first five minutes of the induction procedure had elapsed any subject who had not already closed his eyes was simply told to do so. This direction, like all of the others, was a standard part of the prerecorded instructions.

Subjects who were in the hypnotic groups were initially administered a set of induction instructions. These were followed by suggestions concerning cigarette smoking, which, in turn, were followed by directions requesting them to awaken.

Subjects in the waking groups were first given the same set of induction instructions, and, after a six minute delay, provided with the same awakening instructions. These in turn, were followed by a special statement about the potential efficacy of presenting instructions to persons in a post-hypnotic waking state. That statement was then followed by the set of instructions concerned with bringing about a reduction in cigarette smoking.

Subjects who were members of the control groups were simply hypnotized and then, after a six minute delay, awakened again.

These procedures are summarized, on the next page, in Table 3.

Table 3

Group	Stage 1	Stage 2	Stage 3	Rest Period	Stage 4	Stage 5	Stage 6
Hyp.-High - - - - - Hyp.-Low	Hypnotized	Administered Cigarette Smoking Instructions	Awakened	Subjects Sat Quietly	Not Administered Any Instructions	Informed that Session is Over	Reminded to Return Record Forms in 30 days
Control High - - - - - Control Low	Hypnotized	Not Administered Any Instructions	Awakened	Subjects Sat Quietly	Not Administered Any Instructions	Informed that Session is Over	Reminded to Return Record Forms in 30 days
Wake-High - - - - - Wake-Low	Hypnotized	Not Administered Any Instructions	Awakened	Subjects Sat Quietly*	Administered Cigarette Smoking Instructions	Informed that Session is Over	Reminded to Return Record Forms in 30 days

Time ----------

0 23 29 30 35 41 42 43 Min.

Summary of the treatment procedures. The temporal breakdown and rest periods were to insure that all subjects would be in the hypnotic state for the same length of time, and that the total length of all experimental sessions would be constant.

* Special expectanty instructions administered (see text).

At the conclusion of the experimental session, all subjects were reminded to continue to record accurately the number of cigarettes smoked during each day of the ensuing thirty-day post-treatment period. To insure that each individual would return his record form, subjects were told they would receive payment in the amount of two dollars when their record sheets were received by the experimenter.

As an added incentive each subject was informed that a certain percentage of individuals would be randomly selected, when their record forms were returned, to receive payment in the amount of fifty dollars. It was stressed that this procedure was to assure that all record forms would be returned, and that the fifty dollars would in no way be a function of the numbers of cigarettes smoked. Every subject returned his record form.

Experimental Instructions

The experimental directions concerned with bringing about a reduction in cigarette smoking can be broken down into four major subdivisions for the purpose of analysis.

First, each subject who received those instructions was reminded of the physical dangers inherent in smoking, and was advised as to ways in which the procedures about to be administered to him could help him overcome, or at least reduce, his smoking habit.

Secondly, it was suggested to each person in one of the four major treatment conditions, that if at any time in the future

he happened to smoke a cigarette, he would immediately experience an extremely anxious and uncomfortable feeling. He was told that the feeling would continue to grow in intensity as long as he continued to smoke, but that it would cease completely as soon as he stopped. The subjects were told that they would feel anxious, rather than to experience a bitter taste as has sometimes been proposed (Tracy, 1952), because it has been found that the arousal of anxiety does not depend upon the presence of an external physical agent.

Each subject was told that whenever he stopped smoking, or whenever he refrained from smoking, especially at times when he was accustomed to doing so, he would immediately experience a feeling of contentment and relaxation. It was also suggested that he should immediately practise experiencing the emotions just stipulated to him, first by imagining himself smoking a cigarette, and, then, by imagining he had refrained from smoking. Physiological measures were obtained from some subjects at this time. All subjects, except the controls, were later asked, by means of a questionnaire, for their comments about the efficacy of the emotionality inducing suggestions that had been presented to them. That questionnaire was administered thirty days following treatment.

In the third part of the instructions pertaining directly to cigarette smoking, it was suggested to each subject in the four major treatment conditions that he would smoke less often

in the future than he had in the past and that perhaps he would reach a point where he would no longer desire to smoke.

In addition, in an effort to strengthen the effects of the instructions, each subject was told that he would have a brief dream approximately five nights each week for the first six weeks following his treatment session. He was told that the dream would occur sometime during his normal sleep and that in it he would remind himself to carry out the suggestions he had received about smoking and refraining from smoking. He was also informed, at the same time, that he would practice experiencing the appropriate emotional responses in those dreams.

Each subject was also informed that because people do not always remember having had a particular dream, upon awakening he might not recall the experience, but whether he did so or not, he could still be certain that it had occurred and that it would produce the desired reinforcement effect.

A copy of the exact wording of the tape recorded instructions used in the three studies can be found in Appendix A.

It was mentioned earlier that subjects in the waking groups had been presented with a special set of "expectancy instructions". These taped instructions informed them that it had recently been found that suggestions presented to individuals immediately after hypnosis are fully as effective in inducing a change in behavior as instructions administered while in the hypnotic "trance state".

This procedure was carried out so as to try to equate all groups in terms of their expectations. Although these instructions were not designed to negate the subjects' previous beliefs concerning the supposed power of hypnotically administered suggestions, they were intended to produce comparably high expectations about the waking procedure. Whether or not they actually accomplished this purpose is discussed later.

Immediately following this procedure the subjects were directed to close their eyes and to relax but to remain completely awake and not to become hypnotized. The same instructions concerning cigarette smoking which had been presented to the hypnotic groups were then administered to these waking subjects also.

It will be noted that the only distinction made between the hypnotic and waking conditions in the present study was procedural in nature. That is, these two conditions were not differentiated on the basis of an objective physical measure but instead differed only in terms of the procedures that were carried out. As Barber (1967) has pointed out, this is the only way to distinguish between a "hypnotic" and waking state since no valid objective measures exist that can reliably differentiate between these two conditions.

Physiological Measures

Many theories of emotion stress physiological concomitants (Gellhorn & Loofbourrow, 1963). Therefore, it seemed worthwhile

to provide evidence that the "emotion inducing" instructions had produced a physiological effect. Gidro-Frank and Bull (1950), in arguing the case for the validity of hypnotically induced emotions, showed that physiological corrolates often exist. Because of a lack of adequate equipment in the present instance, however, it was not possible to monitor the physiological responses of every subject. Nevertheless, it was possible, by using a small GSR meter, to obtain a record of changes in galvanic skin response levels from two subjects in each of the six experimental groups throughout the course of their treatment sessions. The results of this procedure are discussed below.

Results

To analyze the results each subject's record of cigarettes smoked during the sixty-day experimental period was subdivided into twelve sessions of five days each. Data from the pretreatment sessions were then used as concomitant variables in performing an analysis of covariance (Winer, 1962) upon scores obtained during the post-treatment sessions. A summary of that analysis is shown in Table 4.

Table 4

Analysis of Covariance Summary Table

Source	Adjusted SS	df	MS	F
Type of Treatment (Hyp. vs. Control vs. Wake)	10860	2	5430	12.28**
Type of Subject (High vs. Low Susceptibility)	11762	1	11762	26.61**
Interaction (Subject x Treatment)	14849	2	7425	16.79**
Error	76541	173	442	
Total	11402	178		

Figure 2, on the next page, graphically depicts the results of the first experiment.

As can be seen in Figure 2 there is a large decrement in cigarette consumption following treatment by highly susceptible subjects who had been administered instructions under hypnosis. A Newman-Keuls test (Hays, 1963) indicated that this is a significant decrease ($p < .001$).

The five highly susceptible subjects in the hypnotic group smoked 1104 fewer cigarettes during the thirty-day post-treatment period than prior to experimental intervention. This represented an immediate decline of over fifty percent in terms of cigarettes smoked. Furthermore, even though these subjects once again began

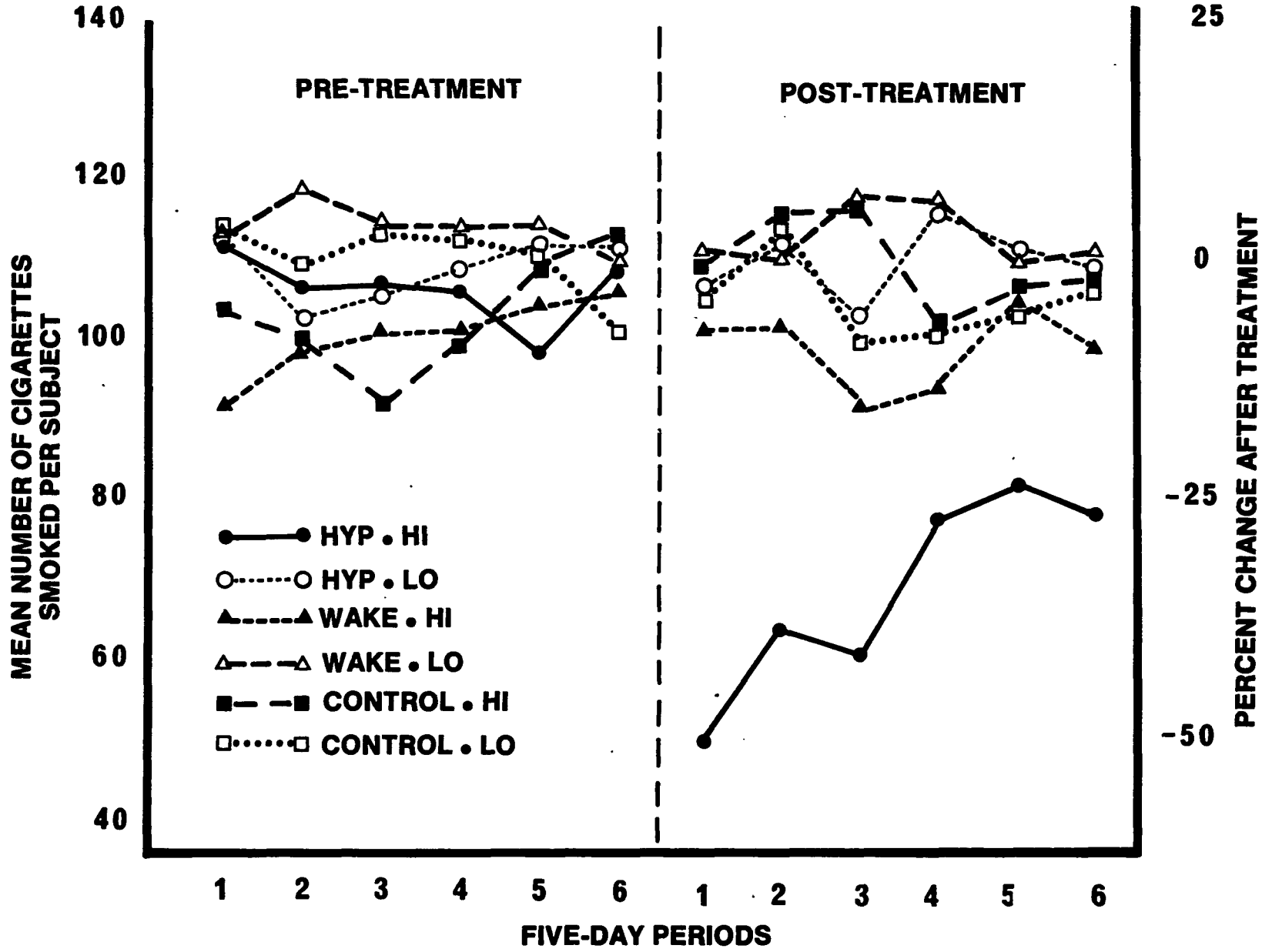

Figure 2. Behavioral Results of Experiment 1. Post-treatment scores (Y) have been adjusted for pre-treatment values (X) by the formula Adjusted Mean.Y - .98(Mean.X - Grand Mean.X). Grand Mean.X=107.06. (Unadjusted post-treatment scores are graphed in Figure 7 of Appendix B.)

to smoke more often towards the termination of the post-treatment period, the amount of smoking they engaged in at the end of that time was, on the average, still twenty five percent lower than pre-treatment values.

The slight trend towards a decrease in smoking in the group of highly susceptible subjects who received the waking instructions was not statistically significant (see Table 19), although three of the subjects in that group did display moderate decreases in cigarette smoking following treatment. Whether the decreases on the part of those individual subjects could be attributed to so-called chance factors, or to the demand characteristics and other interpersonal variables discussed earlier, or whether they were due to some other effect, such as spontaneous reinduction (Hilgard, 1967) was not entirely clear.

Physiological and Psychological Findings

As was noted above, it was possible by using a small GSR meter to obtain a record of changes in galvanic skin response levels from two subjects in each of the six experimental groups throughout the course of their treatment sessions.

An examination of these data (see Table 5) indicated a decrease of at least ten thousand ohms from baseline GSR levels in the case of all four highly susceptible subjects when the suggestions that they should practise experiencing anxiety had

been presented. None of the low susceptibility subjects tested showed any such correspondingly marked changes. Although two subjects from each control group were also monitored, no suggestions concerning emotions were given, so that no relevant statement can be made at this time about their physiological activity.

Although it might be expected that certain physiological measures should correlate with subjective experiences of emotion, as in the present instance, this need not always be the case with currently available physiological recording methods. It is possible, for example, that some emotions may involve reactions in brain centers, such as the limbic system (eg., Egger & Flynn, 1962; Morgan, 1965; Zanchetti, 1967; Delgado, Roberts & Miller, 1954; Fisher & Coury, 1962), and that most modern techniques of electrophysiological monitoring are not sufficiently sensitive, or refined enough, to record such activity.

In addition to physiological and behavioral data it seemed desirable to have evidence that there had been subjective experiences of affect by subjects who received the "emotion inducing" instructions. Consequently, at the conclusion of the sixty-day experimental time period, each subject (except the controls) was asked, by means of a followup questionnaire, whether he had been able, at the time of his experimental session, to experience the emotions suggested to him. A copy of the questionnaire can be found in Appendix C.

The results of this procedure are presented on the next page in column 2 of Table 5.

Table 5

Comparison of the behavioral results, the physiological results, and the subjective results, from Experiment 1.

Group	Subjects Initials and HGS Scores	Physiological Response of 10,000 Ohms or More		Reported Subjective Experiences of Emotion		No. of Cigarettes Smoked in Pretreatment Period	No. of Cigarettes Smoked in Post-treatment Period	Post-treatment minus Pretreatment	*Reduction in Smoking following Treatment	
		Yes	No	Yes	No				Yes	No
Hyp.-High	TBK (10)	X		X		298	183	-115	X	
	LEE (9)			X		409	233	-176	X	
	DCI (9)			X		797	550	-247	X	
	DHG (8)	X		X		800	515	-285	X	
	BOG (8)			X		894	613	-281	X	
Hyp.-Low	JLE (3)				X	781	696	- 85		X
	RMA (3)		X		X	550	642	92		X
	MOO (3)		X		X	492	486	- 6		X
	MJN (4)				X	674	720	- 46		X
	VRY (1)				X	759	798	39		X
Wake-High	GPS (8)	X		X		276	160	-116	X	
	DNR (8)				X	707	801	94		X
	NOU (9)			X		828	728	-100	X	
	HPA (9)	X		X		625	499	-126	X	
	DRE (10)				X	587	595	8		X
Wake-Low	SLO (2)		X		X	931	1223	292		X
	RRN (2)		X		X	1315	1303	- 12		X
	SNE (3)				X	730	692	- 38		X
	DWE (3)				X	257	227	- 30		X
	KER (4)				X	166	112	- 54		X

* Reduction of 100 or more.

Note in Table 5 that all five of the highly susceptible hypnotic subjects reported they had experienced the proper feelings at the time of

their original experimental sessions, but only three of the five highly susceptible waking subjects were able to do so. These three markedly reduced their smoking, unlike the others in their group. Apparently none of the low susceptibility subjects experienced the instructed emotions.

The subjective reports from each subject, then, concerning whether he experienced emotionality at the time of his experimental session, were accurate indicators of the success of "subsequent" behavioral modification. That is, the three highly susceptible waking subjects who reported experiencing emotions, and all five of the highly susceptible hypnotic subjects who did the same, displayed marked decreases in cigarette consumption following treatment (Chi Square. $p < .05$). This finding was in accord with the theoretical conceptualizations to be outlined shortly.

Even though these data indicate that a relationship existed between the subjects' reports and their subsequent behaviors, it is not being argued here that an individual need be cognitively aware of an emotion before it can affect his behavior. This matter is further discussed in Chapter 4.

Discussion

When instructions to reduce smoking were presented to highly susceptible subjects immediately following hypnotic induction subsequent cigarette consumption decreased considerably.

This decrease seems quite dramatic when one considers that it came about as a result of six minutes of experimental instruction. The significance of that decrease seems even more remarkable when one allows for the fact that none of the subjects had been asked to help themselves by making an active effort to stop smoking. In fact, the experimental instructions may have been biased against such active participation.

It seems unlikely that the results can be accounted for simply because the subjects were hypnotized since by and large members of the control groups displayed no comparable effects. Nor could they only have been a function of the subjects being required to keep a record of cigarettes smoked since all subjects did this. It is not clear, however, to what extent the results are due to induced emotions as opposed to associative or cognitive factors or perhaps some other important but unrecognized variables.

The results obtained here cannot be explained by differences between groups in the interpersonal or experimenter variables discussed earlier. With minor variations, the experimenter spent the same length of time with each subject, and each subject (except the controls) was exposed to exactly the same experimental instructions. Similar "demands", or social pressures, were placed upon every individual. Indeed, very little effort was expended in establishing rapport or interpersonal relationships between the subjects and the hypnotist.

Thus, even if one is unwilling to accept the contention that subjects were equated in their expectation, the results still pose difficulties for researchers (eg., Pattie, 1956; Sarbin, 1950) who intimate that all hypnotically induced behavioral changes may be a function of inadvertant experimenter prejudices or sampling biases, or due to certain interpersonal demand characteristics inherent in the typical hypnotic setting (Orne, 1962).

On the other hand, the results lend support to the notion that "induced emotions" could have been critical in bringing about the observed behavioral changes. They also suggest that the use of hypnotic "trance inducing" procedures, in contrast to the waking technique, facilitates the occurrence of behavioral alterations of the type attempted here.

In this connection Barber (1960) has suggested that questions about whether one need institute a hypnotic "trance" to bring about behavioral changes may not be particularly meaningful. Hypnosis cannot be used to enable a person to exceed the potential limits of his capacities. Therefore, it is true that any behavioral change which can be brought about by hypnotic techniques frequently can be brought about in other ways as well. A major practical problem is to determine which procedures are most economical.

It may be meaningless, then, to ask whether or not the relaxed, motivational, or attentive state that subjects usually

assume within the typical hypnotic situation should be termed a "trance". Certainly it often seems necessary to invoke particular procedural prerequisites to achieve behavioral change in the typical hypnotic experiment insofar as the majority of subjects are concerned. Arguing about whether these procedures help induce a "trance", however, is analagous to debating whether one need use the term "illness" once all the biological and other processes involved are fully understood. As Barber (1960) has pointed out attributing hypnotically induced changes to a "trance state" adds nothing by way of explanation.

The results of this study demonstrated that behaviors brought about by using typical "trance inducing" procedures are apparently more than simply a function of the experimenter and interpersonal variables discussed earlier. Precisely what all the factors are that normally contribute to hypnotically induced behavioral changes is not at this time entirely clear. The present study may not have completely ruled out the possibility of differences in subjects' expectations (Barber, 1962) as a factor.

Many of the volunteer subjects who were of low susceptibility as measured by the HGS test reported on their followup questionnaires that they had been highly motivated to stop smoking, and that they had made every effort to do so. In spite of this, however, they were unable to break the smoking habit.

If one accepts the validity of the subjects' verbal reports, and accepts their apparent efforts to cooperate as a reflection of their desires, one would have to conclude that being highly motivated was not a sufficient condition for initiating the observed changes. In fact, the results suggest that although some subjects may, indeed, have wanted to stop smoking, they must have been simultaneously motivated, perhaps, at an involuntary emotional level, to keep on doing so.

Another conclusion of this experiment is that the Harvard Group Scale of Hypnotic Susceptibility can serve as a good predictor of "long term" therapeutic success. All five of the hypnotic subjects who were highly susceptible as measured by the HGS test showed a statistically significant decrease in smoking following treatment, whereas the hypnotic subjects who were of low susceptibility did not. This was so even though none of the items on the HGS test involve "long term" performance.

The finding that the HGS test is a good prognosticator of "long term", as well as short term therapeutic success lends experimental support to the proposal by Hilgard, Weitzenhoffer, and Gough (1958) that hypnotic suggestibility is a multidimensional personality trait that is fairly constant for any given individual.

Experimenter's Observations and Subjects' Comments

During the experiment the investigator made several observations. First, it was observed that although most subjects

in both the hypnotic and waking groups merely sat quietly with their eyes closed while the experimental instructions were administered, two of the five highly susceptible subjects in the hypnotic group did not. Instead, when it was suggested to these subjects that they should imagine themselves smoking, each went through the motions of taking a package of cigarettes from his pocket, lighting a match, and, then, later on, tossing the cigarette away. None of the subjects in the other five groups were seen to display similar behaviors.

A number of highly susceptible subjects in both the waking and hypnotic groups, however, were observed making facial grimaces and licking their lips, suggestive of an effort to spit out a distasteful imagined cigarette, when they were told that smoking would cause them to feel anxious and uncomfortable. None of the low susceptibility subjects were detected making similar gestures.

Some of the low susceptibility subjects appeared dazed when requested to awaken following hypnotic induction, as did many of the highly susceptible subjects under similar circumstances. On the other hand, when subjects were administered instructions while awake very few of them appeared dazed or drowsy afterwards. The instructions to the waking subjects had been terminated by the statement, "You may open your eyes. We are finished with this part of today's session".

A number of subjects provided pertinent comments on their followup questionnaires. Several reported that although they had not stopped smoking completely, they had been finding it almost impossible to finish a cigarette. This suggests that a more refined measure than number of cigarettes smoked could have been employed. Such reports, of course, could have simply been rationalizations by the subjects who made them.

One subject noted that he had experienced a "compulsive need" to refrain from smoking as a consequence of the experimental instructions, although he stated that he had experienced no similar feelings in the past when other persons had asked him to try to stop.

Some subjects indicated that they frequently felt tense throughout the period following their treatment sessions when the idea of smoking came to mind, although one noted that the feeling was not always intense enough to prevent him from smoking. Two subjects said that the emotions that they had been instructed to experience began to extinguish as their thirty-day post-experimental time periods progressed.

A few individuals noted they had been unaware of having had dreams of the type suggested to them. Several subjects requested followup sessions, feeling they would have been helpful.

In future studies of the present type it might be informative to attempt to determine if other behaviors (eg., eating)

show a systematic change as the frequency of smoking cigarettes changes. It might also be worthwhile to try to determine how various anti-smoking campaigns affect subjects of high and low hypnotic suggestibility. This is important since changes in the frequency of cigarette smoking over time may be quite marked in highly suggestible subjects simply because they are susceptible to ongoing advertising campaigns rather than because of the experimental procedures themselves. Evidence for such an effect did not appear in the present study, however, since differences over time between the high and low susceptibility control subjects could not be found. Future studies might also be designed to investigate the effects of procedures of the type used here on populations other than undergraduate college students.

Three of the highly susceptible subjects who received hypnotic instructions reported that even though they experienced unpleasant feelings when smoking, during the first thirty days following treatment, they did not feel relaxed when not smoking as the experimental instructions suggested they would. This failure may have been important in the partial relapse displayed by these subjects (see Figure 2).

If these subjects could have been made to feel more satisfied with "not smoking" than with doing so, or made to feel more satisfied with substitute behaviors (Gould, 1953), this might have fulfilled, or competed with many of the needs that

contributed to their smoking habits. Conceiveably, such a procedure might then have enabled the subjects to stop smoking.

Behaviors performed to avoid unpleasant conditioned emotions can result in response substitution, or extinction (Miller, 1963). Responses carried out because of their intrinsic positive effects, however, are presumably often repeated (Pribram, 1963). Thus, the apparent inability of subjects in this experiment to receive much positive emotional feedback for not smoking may have been a crucial shortcoming.[1]

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1. People may smoke for many reasons. They may like watching the smoke; it may give them something to do with their hands; it may put them at ease socially by helping them reduce or avoid the tension of cognitive and emotional conflicts; the cigarettes may taste good; and so on. Many of these activities, however, apparently have at least one mediating feature in common. That is, each can presumably be experienced as a relatively pleasurable phenomenon. (Note. - It has been assumed that cigarette smoking is not normally physiologically addicting to an appreciable extent.)

Chapter 3

EXPERIMENT 2

Introduction

The first study provided evidence that hypnotic procedures could be utilized to facilitate partial extinction of a previously learned persistent habit. Although, in theory, the extinction and acquisition of habits frequently adhere to the same rules (Fowler, 1965), at a practical level these two processes can be conceptualized as distinct phenomenon. Thus, the first major purpose of this second investigation was to test the possibility of employing procedures, similar to those used in the previous experiment, to establish a new form of responding.

The second purpose was to ascertain the nature of the contributions made to behavioral change by the various types of instructions used in the first study. It will be recalled that the methodological confounding that occurred in the previous experiment did not allow for such a post hoc analysis to be performed. In order to allow for such an analysis in the present instance, three procedures were employed.

First, to separate the contribution made to behavioral change by "emotion inducing" instructions (as opposed to the contribution instituted by using cognitive suggestions), some subjects were presented with cognitive instructions which made

no reference to affect, whereas others were directed to experience emotions when performing specific behaviors. Care was taken to assure that no cognitive suggestion to alter their performance was implied by the experimental instructions to subjects in the affective groups.

It should be stressed that this second study was designed to determine whether emotionally oriented instructions can be employed to achieve "long term" behavioral change. It was not designed to make possible quantitative comparisons between "emotion inducing" procedures and other kinds of techniques.

In order to conduct a test of the reinforcement procedure outlined in the previous experiment, some individuals in this study were presented with reinforcement suggestions immediately following treatment instructions. Other subjects received the same treatment instructions, but were not exposed to subsequent reinforcement directions.

As was the case with the previous investigation, the conditions of this study were arranged to compare the efficacy of administering instructions hypnotically as opposed to presenting them to subjects while awake.

Finally, to determine whether any newly acquired behaviors would be resistent to extinction, as is often the case with habits, each subject was instructed to try subsequently to break any habit that developed as a consequence of the experimental procedures. For the purpose of the present

study "extinction resistent behavior" has been operationally defined as behavior which a subject continues to display in spite of having been asked to make an effort not to do so.

Because demands for experimental precision required a quantitative response that could be analyzed statistically, and because it was desirable to work with an innocuous behavior which normally provides a minimum of intrinsic motivation, the habit dealt with was the consumption of life saver candies. Obviously, one would ordinarily be interested in more meaningful and relevant behaviors. The third experiment was partially designed to indicate one way in which opinions can be influenced by the present techniques. Demonstration of success in this investigation was, however, considered an important prerequisite to that study.

Method

Subjects

Selection of subjects was carried out in essentially the same fashion as in the first experiment.

On the basis of their scores on the HGS test sixty highly susceptible subjects were contacted by mail and an appointment arranged. They were selected at random from the

pool of high susceptibility subjects and were chosen independent of factors such as sex, age, IQ, and so on. Each subject was informed he would receive payment of two dollars, and that a certain percentage of subjects would be randomly selected to receive payment of fifty dollars. This latter procedure was an incentive to encourage participation, and was in no way a function of a subject's performance either before, during, or after his experimental session.

Design

Each subject was randomly assigned to one of twelve groups depending upon (1) whether he was to be presented with instructions while in a waking or hypnotic state, or not presented with instructions; (2) whether the instructions were designed to be cognitive in nature, or to suggest that affect be experienced; and (3) whether the suggestions were to be procedurally reinforced.

Table 6, on the next page, schematically depicts the design of the study.

Table 6

Design of Experiment 2

			Subjects	Period 1	Period 2	Period 3
Hynotic Groups	Affective Groups	Reinforced	1 : 5			
		Not Reinforced	1 : 5			
	Cognitive Groups	Reinforced	1 : 5			
		Not Reinforced	1 : 5			
Control Groups	Affective Control	Reinforced	1 : 5			
		Not Reinforced	1 : 5			
	Cognitive Control	Reinforced	1 : 5			
		Not Reinforced	1 : 5			
Waking Groups	Affective Groups	Reinforced	1 : 5			
		Not Reinforced	1 : 5			
	Cognitive Groups	Reinforced	1 : 5			
		Not Reinforced	1 : 5			

Procedure

The procedure was analogous to that employed in the first study. Once again subjects were seen in groups of two or three. Upon entering the experimental room each subject was informed that all subsequent instructions would be presented by tape recording. After a delay of five minutes, provided to allow subjects sufficient time to become relaxed, the tape recorder was turned on. The content of the experimental instructions is described below.

At the conclusion of the tape recorded procedure the experimenter presented each subject with one package of twelve multiflavored life savers, a one dollar bill, and a record form. Each subject was instructed to use the money to purchase ten additional packages of life savers. In giving these instructions the experimenter did not imply that a subject had to consume any particular number of candies, or even that he had to eat any at all. He simply explained that he wanted each subject to have the same number on hand immediately following the conclusion of his experimental session.

It was assumed that all subjects used the money as directed. Even if they did not, however, this would not markedly alter interpretation of the results because it would merely suggest that the experimental procedures failed to adequately

motivate the subject in question. Furthermore, since all persons received the same instructions there was nothing in them capable of systematically biasing subjects not to make such a purchase.

Every subject was asked to use his record form to keep an accurate account of the number of life savers, if any, that he consumed each day of his subsequent thirty-day post-experimental time period, and to return that record form through the mail at the conclusion of the time interval in question. Each subject was reminded he would be paid for his participation when the record form was received, but that such payment would not depend upon the data on the record sheet.

The subjects were requested not to discuss the investigation amongst themselves. The length of each experimental period was approximately forty five minutes. The instructions pertaining to consumption of life savers required approximately three minutes.

Order of Presentation of Experimental Instructions

Each member of the hypnotic groups was first presented with hypnotic induction instructions, followed by suggestions concerning life savers, followed by directions to awaken.

Each member of the waking groups was administered induction instructions, followed by wakening instructions, followed by the statement about the efficacy of the waking

procedure discussed earlier (see page 20). This statement was followed by suggestions pertaining to life savers.

Subjects in the control groups were hypnotized, and four minutes later awakened, without being administered instructions about life saver consumption. Each of these subjects, at the conclusion of his experimental session, was, however, presented with a package of life savers, one dollar, and a record form along with appropriate instructions about these items.

All subjects receiving a particular type of instruction were exposed to the same set of prerecorded directions. Those receiving reinforcement suggestions, for example, whether in a waking or hypnotic state, or immediately following affective or cognitive instructions, were exposed to the same prerecorded reinforcement directions.

The order of instructions to the experimental groups is outlined on the next page in Table 7.

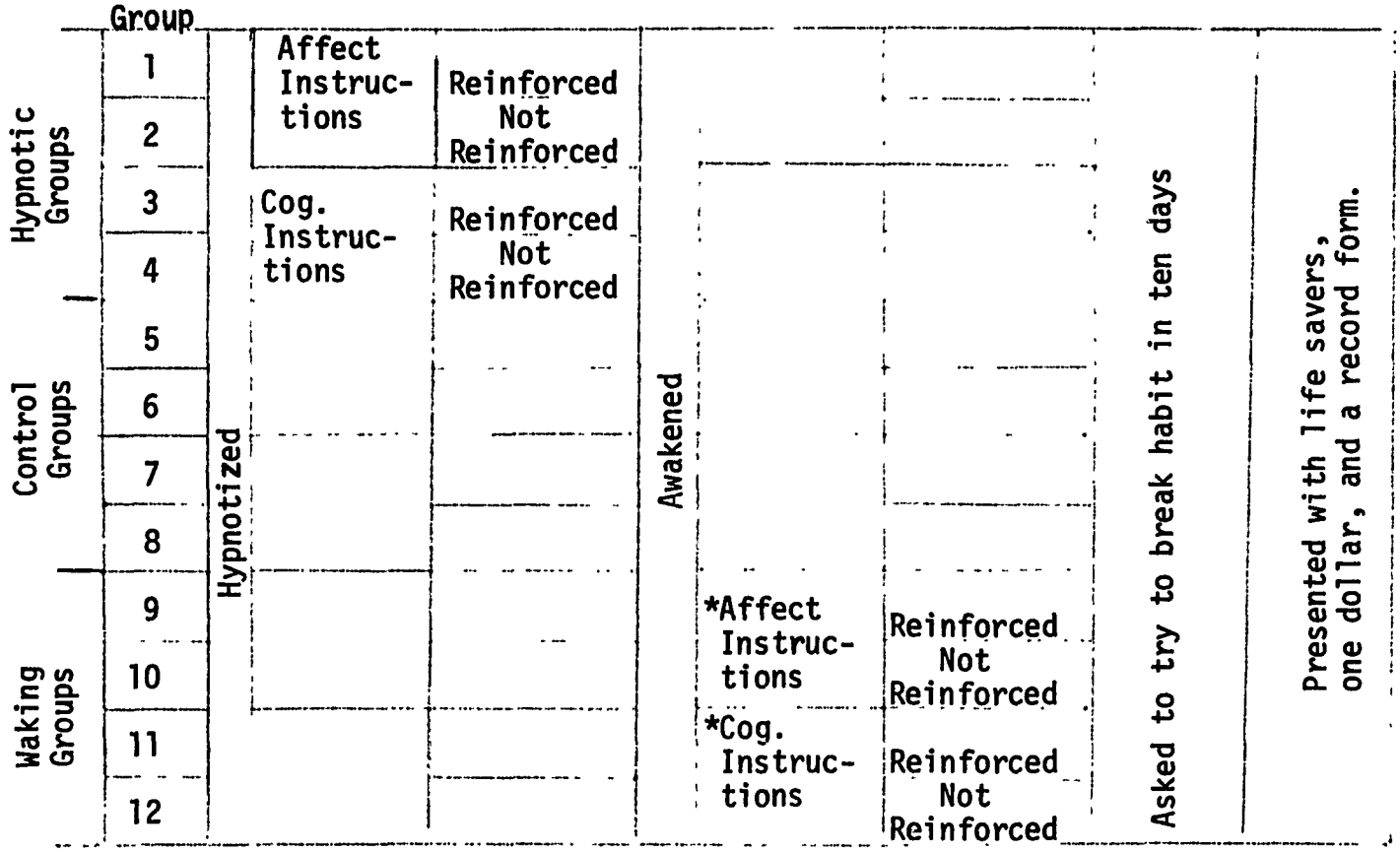
Content of Experimental Instructions

Each subject who received cognitive instructions was told, "Every day for the next twenty days you will consume at least several life saver lozenges of the type I am soon going to present to you".

Every person who received the affective instructions was informed that each time he ate a life saver during the initial

Table 7

Summary of the treatment procedures accorded each group of subjects. (*Expectancy Instructions presented.)



twenty days following his treatment session he would experience a comfortable, relaxed, satisfied, and slightly exhilerating feeling. Each subject was instructed to imagine himself consuming a life saver to provide him with an opportunity to experience those feelings. It was stressed to the subject that no suggestion was being made to the effect that he had to consume life savers during the twenty days in question. He was informed that this would be a matter of his own choice.

Each subject in the reinforcement groups was told that during the first twenty days following his experimental session he would have a brief dream approximately five nights a week. He was told that in those dreams he would remind himself to carry out any experimental suggestions administered to him.

At the conclusion of each experimental session all subjects were exposed to an additional set of prerecorded directions. Those directions asked subjects to try to abstain from consuming life savers beginning ten days following their experimental sessions (see Table 7). They also asked that they continue to do so for the following ten days. The time interval in question corresponded to days eleven through twenty on the subjects' record forms. Appendix A contains a copy of the tape-recorded experimental instructions.

Results

The thirty-day post-experimental time period was divided into three intervals of ten days each and it was expected that the first ten days would represent a period of acquisition during which time the life saver habit would have an opportunity to develop or to exert some sort of observable influence.

The second ten days was intended to provide a test of the life saver habit's resistance to extinction. During this time all members of the four major treatment groups (ie., hypnotic affective, hypnotic cognitive, waking affective, and waking

cognitive) were expected to display decreases in life saver consumption relative to the first ten days, because (a) each of these subjects had been requested to try to stop consuming life savers during the second ten-day period, and (b) because of the elapsed time since the original experimental session. However, life saver consumption during the second ten-day period was still expected to be higher than during the final ten-day period in the case of subjects in the four major treatment conditions. This was expected because the experimental instructions were worded so as to be effective for twenty days and consequently they were expected to exert an effect during the second ten-day (but not the final ten-day) post-experimental time interval. It was assumed that a baseline level of eating life savers would develop during the final ten-day period that would reflect the amount of life saver consumption which might normally be expected to occur independent of any hypnotically induced effects.

During their second ten-day post-experimental periods subjects in the treatment groups were expected to consume more life savers, on the average, than control subjects. This was so because the control subjects were not expected to experience difficulty in abstaining from eating life savers during that time.

To analyze the results of this experiment each subject's record form was subdivided into three time periods. Each of these contained two sessions of five days apiece.

Figure 3 on the next page graphically depicts the behavioral results. The distinction defined earlier between the reinforced and non-reinforced groups has been ignored in plotting the data. The effects of the reinforcement technique will be discussed later.

To determine the statistical significance of the differences between groups in Figure 3 an analysis of variance (Winer, 1962) was performed. The analysis, which showed the presence of significant differences ($p < .01$), is summarized in Table 21 of Appendix B. In addition, each of the three experimental periods was analyzed separately.

Duncan's procedure (Winer, 1962) was used to test for differences among the three means obtained from the hypnotic groups, the waking groups, and the control groups during the initial ten-day acquisition period. The results appear in Appendix B and the means are presented below in Table 8.

Table 8

Average Number of Life Savers Consumed per subject in Period 1

	Hypnotic Groups	Waking Groups	Control Groups
Period 1	30.62	25.27	8.82

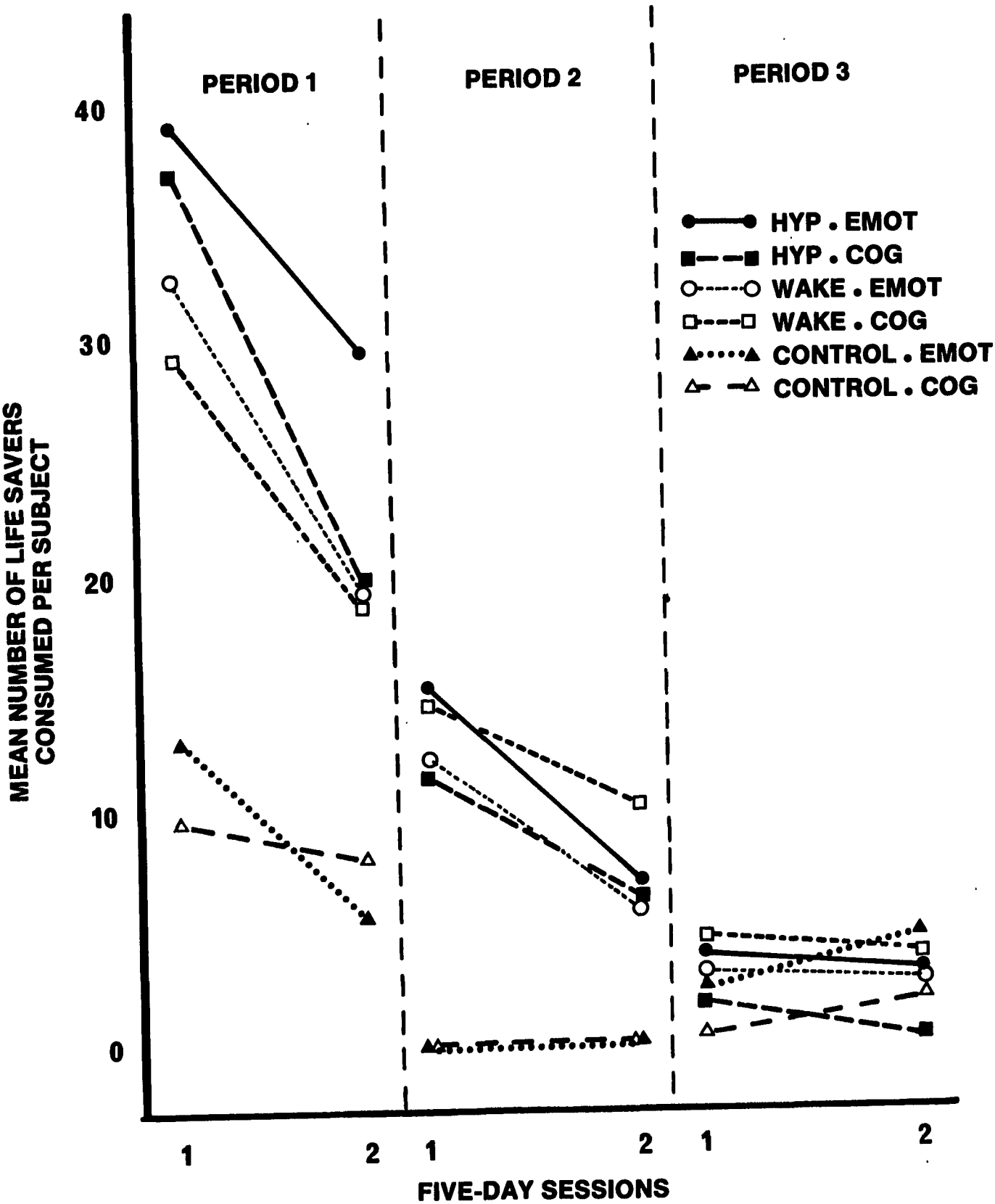


Figure 3. Acquisition of a new habit as a result of the treatment procedures employed. (Note. - Reinforcement and "no reinforcement" data have been pooled.)

As can be seen in Table 8, subjects in both the waking and hypnotic groups consumed more life savers ($p < .01$) during the initial ten-day period than control subjects. Hypnotic subjects ate significantly more life savers ($p < .05$) during that period than waking subjects.

Dunnett tests (Winer, 1962) were performed between the means of the control groups during the second ten-day post-experimental period and the means of the four major treatment groups during that same interval. These means are depicted below in Table 9.

Table 9

Average Number of Life Savers Consumed per Subject in Period 2

	Hypnotic Groups		Waking Groups		Control Groups	
	Affective	Cognitive	Affective	Cognitive	Affective	Cognitive
Period 2	11.30	9.50	9.35	12.35	0	0
	<---------- Treatment Groups---------->					

Analysis of the data in Table 9 indicated that subjects in each treatment group consumed significantly more life savers ($p < .05$) during the second ten-day period than control subjects. This suggests that the habit of eating life savers resisted extinction for subjects in the treatment groups since they were

apparently unable, or unwilling, to refrain from consuming them during the second ten-day period. As can be seen in Table 9 this was not true of the controls.

It is possible that differences between the treatment and control groups during the second ten-day period could have materialized as an extension of differences between them during the initial ten-day acquisition session (see Figure 8). Even if this was the case, however, the fact remains that subjects in the treatment groups did not stop eating life savers during the second ten-day period, in spite of having been asked to try to do so, and presumably making an attempt to do so. The results of the present study support the predicition, then that the life saver habit would resist extinction in the case of subjects in the treatment groups and that those subjects would continue to eat life savers during the second ten-day period. The reason why they continued to consume life savers during that time may have been a function of their higher levels of consumption during the initial ten-day interval or may have been due to the presence of an experimentally induced drive (Hull 1943; Spence, 1960) that compelled them to continue eating the candies.

A Duncan test among the means of the four major treatment groups during the second ten-day period (see Table 9) disclosed no statistically significant differences amongst the four major treatment procedures themselves.

A Newman-Keuls test on the means of the six groups represented in Figure 3 based upon scores from the final ten-day period failed to reveal statistically significant differences.

Comparison of the Three Post-experimental Time Periods

Newman-Keuls tests were performed among means from the three post-experimental time periods. These means are shown below in Table 10.

Table 10

Average Number of Life Savers Consumed per Subject During Successive Post-treatment Periods

	Period 1	Period 2	Period 3
Hynpotic Groups (Affective and Cognitive)	30.62	10.50	2.57
Waking Groups (Affective and Cognitive)	25.27	10.85	3.32

Note. - Control group data are not included.

The results of this analysis indicated that the three pooled treatment means (ie., the mean treatment scores from the initial ten-day period; the mean treatment scores from the second ten-day period; and the mean treatment scores from the

final ten-day period) differed significantly from one another ($p < .05$) both for the waking and hypnotically treated subjects. This was in accord with the prediction (see page 47) that subjects in both the waking and hypnotic treatment groups would consume fewer life savers during the second ten-day period than the first, and fewer still during the final ten-day period.

Summaries of the major statistical procedures detailed here can be found in Appendix B.

Reinforcement vs. No Reinforcement

In assessing the reinforcement instructions the distinction between affective and cognitive suggestions was ignored. This procedure was legitimate since a t-test (Garrett, 1958) disclosed no significant differences between the affective and cognitive techniques.

Figure 4 shows the results of the reinforcement procedure plotted over successive five-day intervals.

Duncan tests assessing the reinforcement procedure by considering the affective and cognitive data separately (rather than in combination as in Figure 4) did not reach statistical significance.

Data from each of the three periods depicted graphically in Figure 4 were analyzed individually.

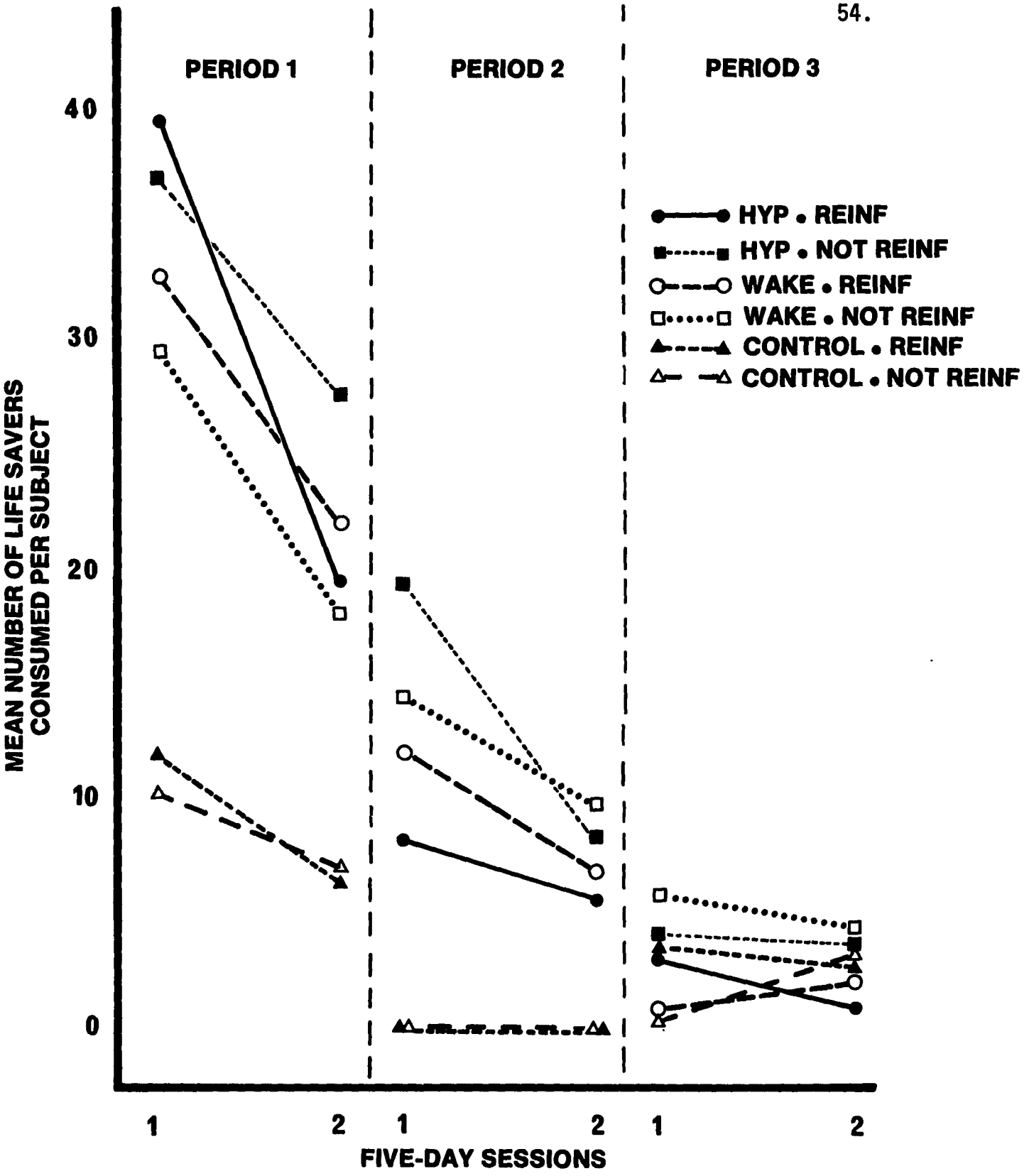


Figure 4. Results of the reinforcement procedure. (Note. - Affective and cognitive data have been pooled.)

A Duncan test performed among the means from the reinforced, nonreinforced, and control groups during the initial ten-day acquisition period failed to reveal statistically significant differences between the reinforcement and "no reinforcement" procedures.

Similar tests upon data from the second and third ten-day post-experimental periods also failed to disclose statistically significant differences between the reinforced and nonreinforced conditions.

Discussion

While both waking and hypnotic suggestions apparently caused subjects to acquire a new habit, the hypnotic suggestions were superior (although not greatly so) to the waking in instituting such behavior. This again indicated that there may be elements in the so-called trance state that can influence behavior in ways that cannot be accounted for by detectable differences amongst the experimenter, interpersonal, and subject variables discussed earlier.

Several comments by subjects on their followup questionnaires suggested that the results of the present study could not be accounted for by variables such as perceived social pressure, nor entirely explained on the basis of a conscious effort by subjects to please the experimenter. For example,

one person stated, "My behavior may somewhat have been a conscious desire to fulfill an obligation to the experimenter. However, I have always disliked candy in the past and I recognized that I would be paid regardless of what my record form said, as long as I kept tabulation".

In spite of the fact that subjects in the hypnotic groups consumed more life savers during the initial ten-day period than subjects in the waking conditions, there was no statistical difference between these two groups in frequency of life saver consumption during the second ten- day post-experimental time interval.

In view of the small differences found between the waking and hypnotic procedures in the present study, and in view of the evidence presented by Barber (1969) that such differences rarely occur when the relevant variables are properly controlled, the significance of the differences found here should not be too strongly emphasized. It may be that they occurred only because subjects in the waking groups had poor expectations about the power of the waking procedure.

In view of the fact that waking subjects consumed more life savers than the controls it might be helpful in future studies of the present type to include a control group which receives no induction instructions whatsoever but which does receive directions to consume life savers. This might allow

one to better estimate what effect the life saver instructions alone (in the absence of any hypnotic procedures) are able to exert in terms of causing subjects to acquire a life saver eating habit.

Although subjects in the treatment groups failed to stop consuming life savers during the second ten-day post-experimental interval, this would not necessarily have been the case under all circumstances. The probability that any given behavior will occur must be considered relative to the probability of other response tendencies (Atkinson, 1964). Had the subjects been sufficiently and properly motivated they likely would have been able to prevent themselves (or could have been prevented) from consuming life savers during the period in question.

The reinforcement procedure attempted here failed to produce the desired effect. Within the first few days following treatment virtually all subjects showed a decline in life saver consumption and in most cases it had become quite marked well before the end of the initial ten-day acquisition period.

Furthermore, differences in life saver consumption between subjects in the reinforced and nonreinforced groups during the second ten-day post-experimental period were opposite to those predicted. That is, subjects in the nonreinforced groups ate more life savers, on the average, during that period than individuals administered reinforcement instructions.

It is possible that some subjects failed to stop eating life savers during the second ten-day period for reasons unrelated to experiencing difficulty in trying to stop. Instead, they may have failed to refrain from eating the candy during that time because of forgetting about, misunderstanding, or repressing knowledge concerning the request to try to stop. Even if this was the case, however, it apparently does not represent the complete explanation since several subjects who did not stop eating life savers indicated on their questionnaires that they had not forgotten about being asked to try to do so.

From a practical standpoint failure of the reinforcement procedure presents a problem that should probably be accorded further experimental attention. Perhaps subjects could be taught to use autohypnosis or the reinforcement technique proposed. On the other hand, it may be that followup sessions, along with imposition of intense experimenter-subject interactions, are necessary prerequisites to long term behavioral changes by application of the methods and principles detailed here. This assumes that relatively permanent changes can be achieved.

As pointed out earlier, comparisons of habit strength between subjects in the cognitive and affective groups could not be made meaningfully on a quantitative basis. The behaviors displayed by subjects administered cognitive instructions, for

example, might have been radically different from those which occurred had those subjects been requested to eat several hundred life savers each day, instead of several, as they were directed to do.

Similarly, if subjects in the cognitive groups had been told that they should eat life savers (instead of that they would), the outcome might have been different. This is so because such a request might have implied that the experimenter wanted them to eat life savers for reasons extrinsic to any waking or hypnotically induced effects. For example, such a request might have been carried out initially because subjects felt the experimenter wanted them to do so as a favor. Some subjects in the cognitive groups could, of course, have interpreted the directions they received in a similar manner.

One can only conclude, then, with respect to questions about the efficacy of cognitive and affective techniques that in the present instance both procedures constituted successful methods for altering behavior.

Subjects' Comments

To determine whether behaviors instituted by using the present procedures were simply associative reactions, or possibly dissociative reactions, to the experimental instructions or whether, even in the case of subjects in the cognitive groups,

they had been emotionally mediated as well, comments on the followup questionnaires were examined.

Although a few subjects reported occasionally finding themselves eating life savers, indicating the possibility that a purely associative process may have been in operation, most subjects, including those receiving cognitive instructions, alluded to emotional involvement.

One subject reported experiencing feelings of relief when consuming life savers which she stated were similar to the type frequently associated with completing a job long overdue. Many reported they ate more when anxious or studying, and one noted that he had paused to consume one in the midst of a scholastic examination to "calm himself down" successfully.

Some subjects reported being repulsed by life saver consumption during the final ten-day post-experimental period.

The relative conceptual distinction between affect mediated behaviors and associative activities will be further discussed in Chapter 4.

Some of the subjects' remarks suggested that the measure used in this experiment to record life saver consumption may not have been sufficiently refined. One subject stated, "I ate a lot of life savers at first. Then they lost their appeal. After that I started to eat Certs". This may have been an example of stimulus or response generalization (Pavlov, 1927).

Several persons indicated that they would have eaten more life savers throughout the period following their experimental sessions had it not been for the fact that sometimes, when out for an evening, they had run out of them.

Some subjects reported experiences which were unique. One commented, "Whenever I eat a life saver I am subjected to what is becoming a standard conscious subvocalization. 'Buck up fellow. This is a life saver. You are supposed to feel exhilerated. Smile! You feel warm and content.' Aside from this repetitious annoyance I continue to consume the candy." In addition, this subject reported becoming aware of an unusual preference for mints, which he stated were alien to his customary tastes.

A few individuals reported experiencing spontaneous amnesia, immediately following their experimental sessions, of the instructions about life saver consumption. The third experiment in this thesis was partly concerned with manipulating the process of "hypnotically induced amnesia".

Chapter 4

EXPERIMENT 3

Introduction

The first two studies indicated that overt performance can be affected by hypnotic procedures. This third study attempted to demonstrate that covert behaviors can be similarly affected. It was designed to demonstrate that an individual's opinions can be biased in a predictable fashion as a consequence of his experiencing particular feelings at the time his opinions are being formed (Schachter, 1964). In the present case, hypnotic techniques were used to generate these feelings.

This investigation was also designed to demonstrate one way in which cognitive and emotional elements can interact to affect behavior (Schachter & Singer, 1962). The specific prediction was that since cognitive information can facilitate discrimination, individuals told about the source of their feelings would be less likely to react indiscriminately in response to them than persons possessing improper, conflicting, or inadequate information about their affective conditions.

For example, an individual cognitively aware of the source responsible for helping arouse his emotions can say to himself, "I know what is making me feel this way". Having made such a cognitive discrimination about his own affective condition,

that person might not be expected to react towards any irrelevant stimuli present as though they were causing his feelings.

On the other hand, an individual unaware of the source of his feelings, and unable (cognitively or noncognitively) to make the proper discrimination might incorrectly attribute his feelings to irrelevant stimuli. These would be irrelevant in the sense that they were not actually functioning so as to elicit his emotions (Schachter & Singer, 1962; Rosenberg, 1960). Such incorrect responding might continue if the person previously unable to make the appropriate discrimination was not subsequently able to do so.

To test the ideas just proposed, the present study was designed to insure that certain subjects would be prohibited from maintaining useful knowledge concerning the source of their feelings. This was done by using hypnotically induced amnesia.

The process of hypnotically induced amnesia need not involve permanent forgetting (Chaves, 1968). It may result as a consequence of suppression, or from an inability to retrieve specific bits of stored information. Subjectively, the experience may be similar to one in which an individual cannot recall the name of an old acquaintance, even though he may have the feeling that it is "on the tip of his tongue".

The fact that subjects may subsequently remember does not necessarily invalidate the possibility of using hypnosis to induce a <u>temporary</u> functional amnesic state.

The present study was designed to use hypnotic techniques (1) to arouse specific emotions in response to particular stimuli, and (2) to prevent certain subjects from being aware of the role those stimuli were playing. Thus, the present study provided a test of the capacity of hypnosis to accomplish these two functions.

Finally, it should be noted that an individual can sometimes react inappropriately towards stimuli even in the absence of hypnotically induced amnesia. This can occur even though a person is aware of the fact that particular stimuli are not in fact contributing to his emotional condition. For instance, a man might, as an emotional outlet, kick his dog when angry at his boss but at the same time fearful of expressing anger towards him (Miller, 1963). Such inappropriate responding might be expected if it satisfied an individual's immediate emotional requirements by making him feel better (Buss, 1963).

One purpose of the present study was to demonstrate that displaced behaviors of the kind mentioned can be made to take place experimentally. That is, the purpose was to show that behaviors appropriate to an eliciting stimulus can be made to occur in response to a noneliciting agent. In the present instance these were expected to occur as a consequence of inadequate or improper discriminations by the experimental subjects, rather than as a function of the direct suppression

or inhibition of an unsatisfied drive and its associated response patterns.

An implication of this experiment is that persons' emotions (or the lack of them) may influence their behavior in seemingly illogical ways if they fail to discriminate the source of their feelings. For example, a man may blame his wife for his unhappiness because he feels despondent in her presence even though she may not be contributing to his discomfort. Other examples involving failure to make the proper discrimination of an emotion's source (eg., some cases of scapegoating) may develop in accordance with the dynamics to be tested and demonstrated here. These would normally occur independent of hypnotic involvement.

Method

Design

The experimental design of this investigation was similar to those utilized in the first two studies. Sixty subjects were selected according to the same criteria as in the second experiment, and they were presented with similar instructions concerning payment of two dollars in exchange for their participation.

Before his single experimental session each subject was randomly assigned to one of twelve conditions depending upon (1) whether the procedures to be administered to him were intended to induce feelings of positive affect, negative affect, or no feelings at all; (2) whether instructions were to be administered immediately following hypnotic induction and before awakening, or administered in a waking state; and (3) whether he was to be instructed not to remember that a particular stimulus would be acting as an eliciting emotional agent.

Table 11, on the next page, schematically illustrates the design.

Procedure

The procedure for this experiment was analogous to that of the second study, and once again all instructions were presented by tape recording.

To test the ideas proposed earlier, some subjects were instructed to experience positive emotions while others were told they would experience negative emotions.

Subjects designated to experience positive affect were told that every time a yellow light in the experimental room was turned on they would immediately experience a contented, satisfied, and slightly exhilerating feeling. They were told

Table 11

			Subjects	Questions * 1	2	3	4	5
Positive Emotion	Hypnotic Instructions	Amnesia	1 . . 5					
		No Amnesia	1 . . 5					
	Waking Instructions	Amnesia	1 . . 5					
		No Amnesia	1 . . 5					
No Emotion	No Instructions	Amnesia	1 . . 5					
		No Amnesia	1 . . 5					
	No Instructions	Amnesia	1 . . 5					
		No Amnesia	1 . . 5					
Negative Emotion	Hypnotic Instructions	Amnesia	1 . . 5					
		No Amnesia	1 . . 5					
	Waking Instructions	Amnesia	1 . . 5					
		No Amnesia	1 . . 5					

Design of Experiment 3. (*See text.)

that the feeling would increase in intensity as long as that light remained on, but that it would dissipate completely as soon as it was turned off.

Subjects designated to experience negative affect were presented with analogous instructions but were informed that every time the yellow light was turned on they would immediately feel quite uncomfortable, anxious, and slightly irritable.

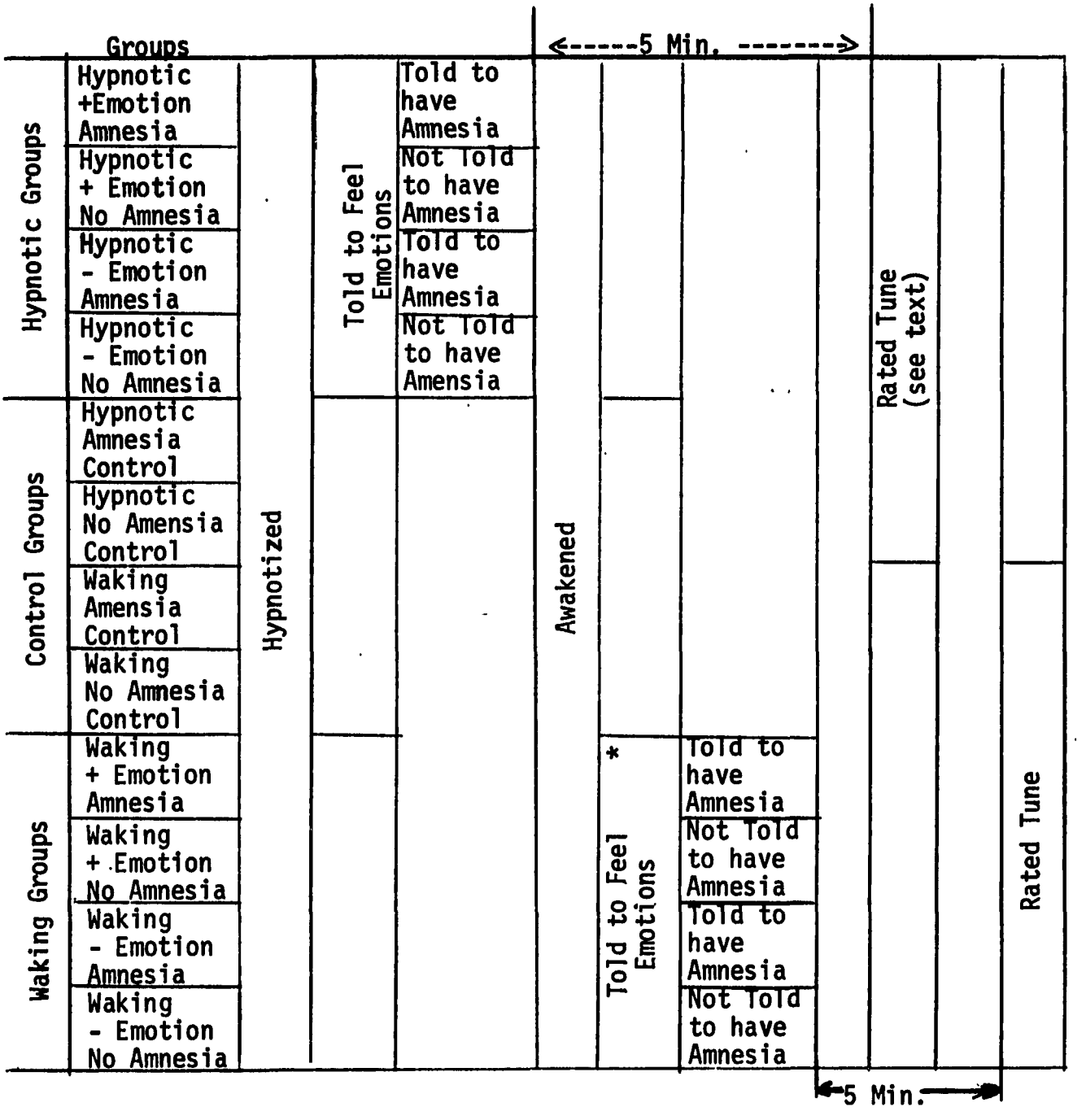
Shortly after these instructions had been presented the experimenter turned on the yellow light for thirty seconds. Subjects were then instructed by tape recording to experience the feelings suggested to them for the duration of that time.

Subjects in the "no emotion" control groups were hypnotized and, after a brief delay, awakened again.

Table 12, on the next page, graphically depicts the treatment procedures accorded each group. Notice that all subjects were in the hypnotic state for the same length of time, and that the length of time between completion of the experimental instructions and the rating procedure was constant across conditions. Note also that waking subjects were in the experimental room longer than hypnotic subjects as of the time the treatment instructions were administered. This difference was necessary to equate groups in terms of time spent in the "trance" state. The waking subjects spent the extra time sitting quietly.

Table 12

Summary of treatment procedures to Hypnotic and Waking Groups



(* "Expectancy Instructions" presented.)
(- see page 20).

To assess the effects of cognitive knowledge on emotionally mediated behavior some subjects were given instructions intended to produce waking or hypnotically induced amnesia. These amensia techniques were designed to try to prohibit them from maintaining certain cognitive information. Other subjects were told they would be able to recall that information.

Subjects given amnesia instructions were informed that every time the yellow light was turned on they would immediately experience the appropriate positive or negative feelings, depending upon the group they were in. They were instructed that they would be unaware that the yellow light was responsible for their feelings.

Subjects in the "no amnesia" conditions were presented with analogous instructions but were told they would realize that the yellow light was responsible for their emotional status.

The directions presented to each group are summarized on the next page in Table 13. A copy of the tape recorded instructions and a synopsis of all procedural manipulations (eg., the relationship between onset of the yellow light and timing of the experimental suggestions) can be found in Appendix A.

For five minutes following termination of the tape recorded instructions subjects sat quietly (see Table 12). Next, they were asked to listen to and be prepared to independently evaluate an instrumental recording entitled "Horn Duey". It was played by a group known as King Richard's Fleugal Knights.

Table 13

Summary of Instructions Given Each Group

	Group		
Positive Emotion Groups	Hypnotic + Emotion Amnesia	Told to Experience Positive Emotions in response to the Yellow Light	Told to Have Amnesia
	Waking + Emotion Amnesia		
	Hypnotic +Emotion No Amnesia		Not Told to have Amnesia
	Waking + Emotion No Amensia		
No Emotion Groups	Hypnotic Control Amnesia	Not Told to Experience Emotions in response to the Yellow Light	Told to Have Amnesia
	Waking Control Amnesia		
	Hypnotic Control No Amnesia		Not Told to Have Amnesia
	Waking Control No Amnesia		
Negative Emotion Groups	Hypnotic - Emotion Amnesia	Told to Experience Negative Emotions in response to the Yellow Light	Told to Have Amnesia
	Waking - Emotion Amnesia		
	Hypnotic - Emotion No Amnesia		Not Told to Have Amnesia
	Waking - Emotion No Amnesia		

The record required approximately four and one half minutes of playing time. At the same time the record was turned on the experimenter turned on the yellow light. This remained on throughout the record, and was turned off precisely as the recording came to an end.

This technique was used to insure that the arousal and dissipation of each subject's feelings would correspond with the onset and offset of the music. It was anticipated that this procedure would make it difficult for subjects in the amnesia groups to discriminate that it was not the music but rather the yellow light which was responsible for their emotions. Such a discrimination was presumably virtually impossible (assuming, of course, that the amnesia instructions were successful) because these subjects had been informed that they would not be aware that the light was the cause of their emotions.

Subjects in the "no amnesia" groups, of course, had been informed that they would be so aware.

Thus, it was predicted that subjects in the amnesia conditions might formulate a tentative association between the music and their own continguously experienced feelings and react accordingly. Individuals in the "no amnesia" groups were not expected to react to the music in such a fashion because they possessed accessible knowledge about the function of the yellow light.

The above procedure was designed to preclude cues that would signify to subjects that there existed reasonable grounds for uncertainty about what they believed was the source of their feelings. In addition, subjects were required to make an immediate evaluation intended to prevent them from reserving judgement or effectively registering uncertainty.

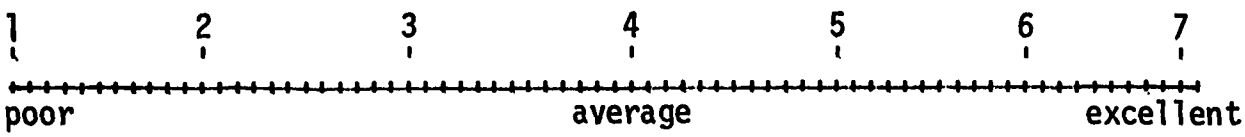
It must be emphasized that the present formulation does not propose that being unaware of one source of displeasure (eg., a yellow light) makes other adjacent stimuli (eg., music) less pleasing than might otherwise be the case. Instead, what is being suggested here is that if one recognizes that a particular stimulus (eg., music) is <u>not</u> responsible for arousing unpleasant feelings than one is less likely to label the music unpleasant than if one believes that that music is actually producing such an effect.

<u>The Evaluation Procedure</u>

Immediately following the music, subjects were presented with an evaluation form (see Appendix D) upon which they were asked to judge the recording in terms of (1) the ability of the musical lead; (2) their opinion of the melody; (3) their evaluation of the musical accompaniment; (4) the likelihood they would buy the record; and (5) the likelihood they would play it if it were given to them.

Each question about the instrumental recording was followed by a line one hundred and fifty two millimeters long upon which subjects were requested to draw an X to indicate their response. For example, the third question was presented as follows:

My evaluation of the musical accompaniment is that it was;



Subjects were assigned one score on each question ranging in value somewhere between zero and one hundred and fifty two, depending upon where they placed their mark.

The particular recording was chosen because the experimenter felt that most subjects would be unfamiliar both with the tune and its arrangement, as well as with the musicians who played it. The results might have been different had a tune been selected about which subjects had already formed an opinion since it seems reasonable to suppose that well established opinions are less liable to be affected by momentary fluctuations in mood than are newly developing ones.

Data attributable to individual perferences constituted the error terms for the statistical analyses performed.

Subjects' evaluation of the music were made individually without public commitment thereby eliminating or greatly reducing

chances that their expressed beliefs differed substantially from their customary, privately held, attitudes or response predispositions. In addition, an effort was made to assure that the questions posed were not phrased in a leading or biased fashion.

Results

To assess the effects of the "emotion inducing" instructions five analyses of variance were performed upon data from each of the five questions discussed above. Summary tables from each of these can be found in Appendix B. These analyses indicated that the "emotion inducing" instructions had produced a significant effect ($p < .01$).

Figure 5 on the next page, represents a composite of results from each of the five questions. Notice that the distinction between amnesia and no amnesia groups has been ignored in plotting the data. Results of the "amnesia inducing" instructions will be presented shortly.

To determine the extent to which differences depicted in Figure 5 were statistically meaningful, five Dunnett tests (Winer, 1962) were performed. These were performed among means from the positive emotion, negative emotion, and "no emotion" groups. One test was conducted upon data from each of the five questions. In conducting these tests hypnotic and waking data as well as amnesia and no amnesia data were pooled.

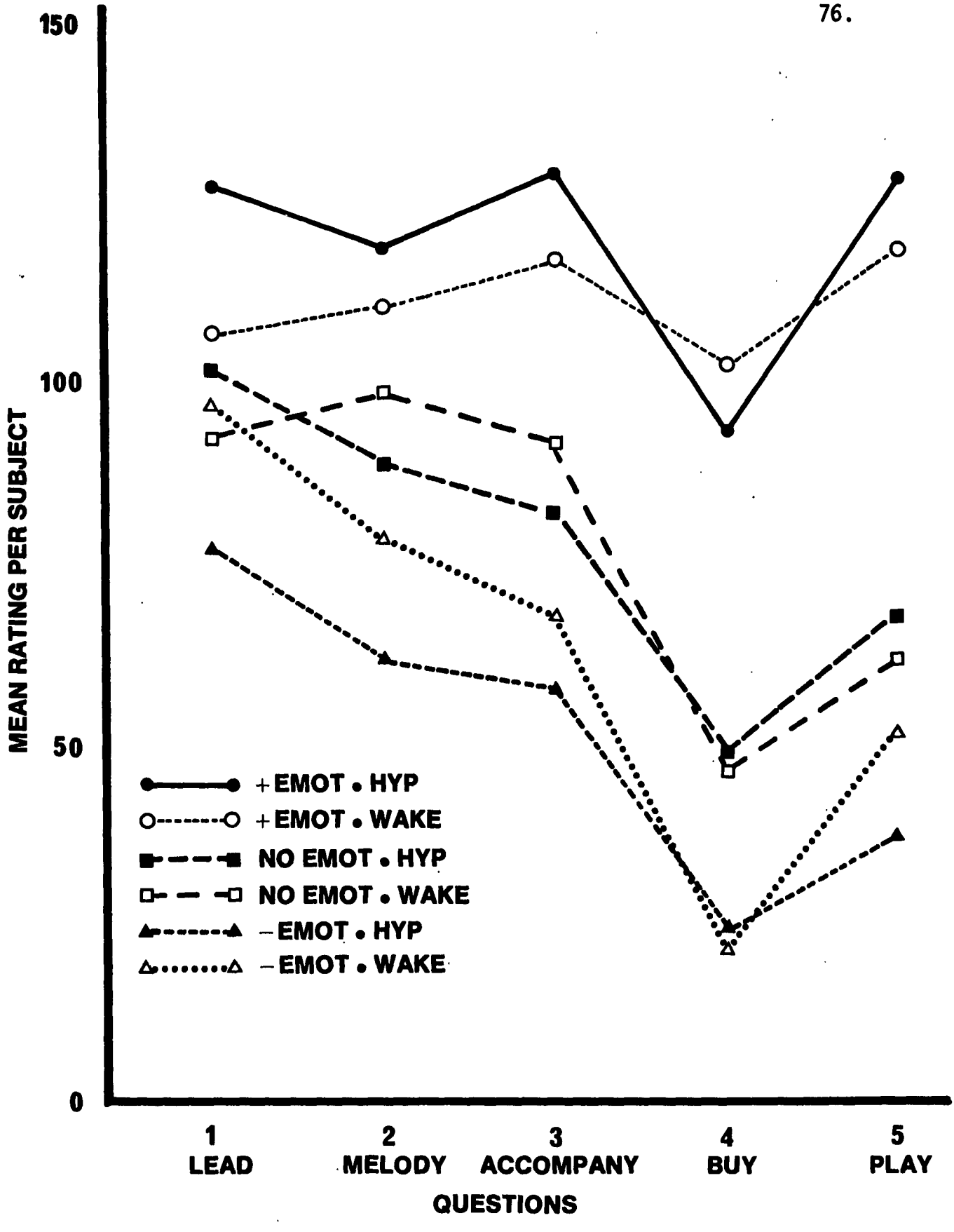


Figure 5. Results of the "emotion inducing" procedure.
(Note. - Amensia and "no amnesia" data have been pooled.)

Table 14 summarized the results of this analysis.

Table 14

Effect of Induced Emotions on Evaluation of the Musical Tone

	Groups of Subjects		
	Positive Emotion	No Emotion	Negative Emotion
Question 1	116.55	96.20	86.95
Question 2	115.65	93.05	68.90
Question 3	122.65	86.45	62.05
Question 4	96.80	46.10	24.65
Question 5	121.65	65.60	47.35

Scores = mean rating by each group.

Dunnett tests indicated that all differences between groups in Table 14 are significant ($p < .05$).

Scores on the first question from the negative emotion group were not considerably lower than scores from the corresponding "no emotion" condition. This suggests that some behaviors may be more susceptible to ongoing emotional activity than others. For example, in this study judgements of the musician's ability may have been less affected by emotional factors than judgements of the melody (see Figure 5, questions 1 and 2).

The results support the prediction that positively and negatively induced emotions can differentially affect covert as well as overt behaviors (Homme, 1965; Inglis, 1961).

Summary tables of the major statistical techniques used in this experiment can be found in Appendix B.

Amnesia vs. No Amnesia

To ascertain whether the amnesia instructions had been successful in terms of the predictions advanced, the following technique was employed. Since no hypothesis had been made to the effect that the amnesia procedure would differentially influence the five questionsall five scores from each subject were summed. This total score was assumed to be a reflection of a subject's overall attitude about the musical selection.

A multiple correlation analysis (Ferguson, 1959) indicated that data from each of the five questions correlated significantly amongst themselves and with the total scores. This suggested that the summing procedure was valid.

Table 15, below summarizes the correlation analysis.

Table 15
Intercorrelations amongst the five questions and the total scores

	Question 1	Question 2	Question 3	Question 4	Question 5	Total Scores
Question 1	1.00**	.65**	.64**	.54**	.57**	.77**
Question 2	---	1.00**	.75**	.73**	.65**	.87**
Question 3	---	---	1.00**	.71**	.73**	.89**
Question 4	---	---	---	1.00**	.74**	.88**
Question 5	---	---	---	---	1.00**	.87**
Total Scores	---	---	---	---	---	1.00**

Note. - Each subject's total scores is equal to the sum of his five sub-scores.

** Significant at .01 level

Data from the summing technique just described are depicted in Figure 6. The highest possible evaluation of the musical selection for each subject was 760. The lowest evaluation possible was zero.

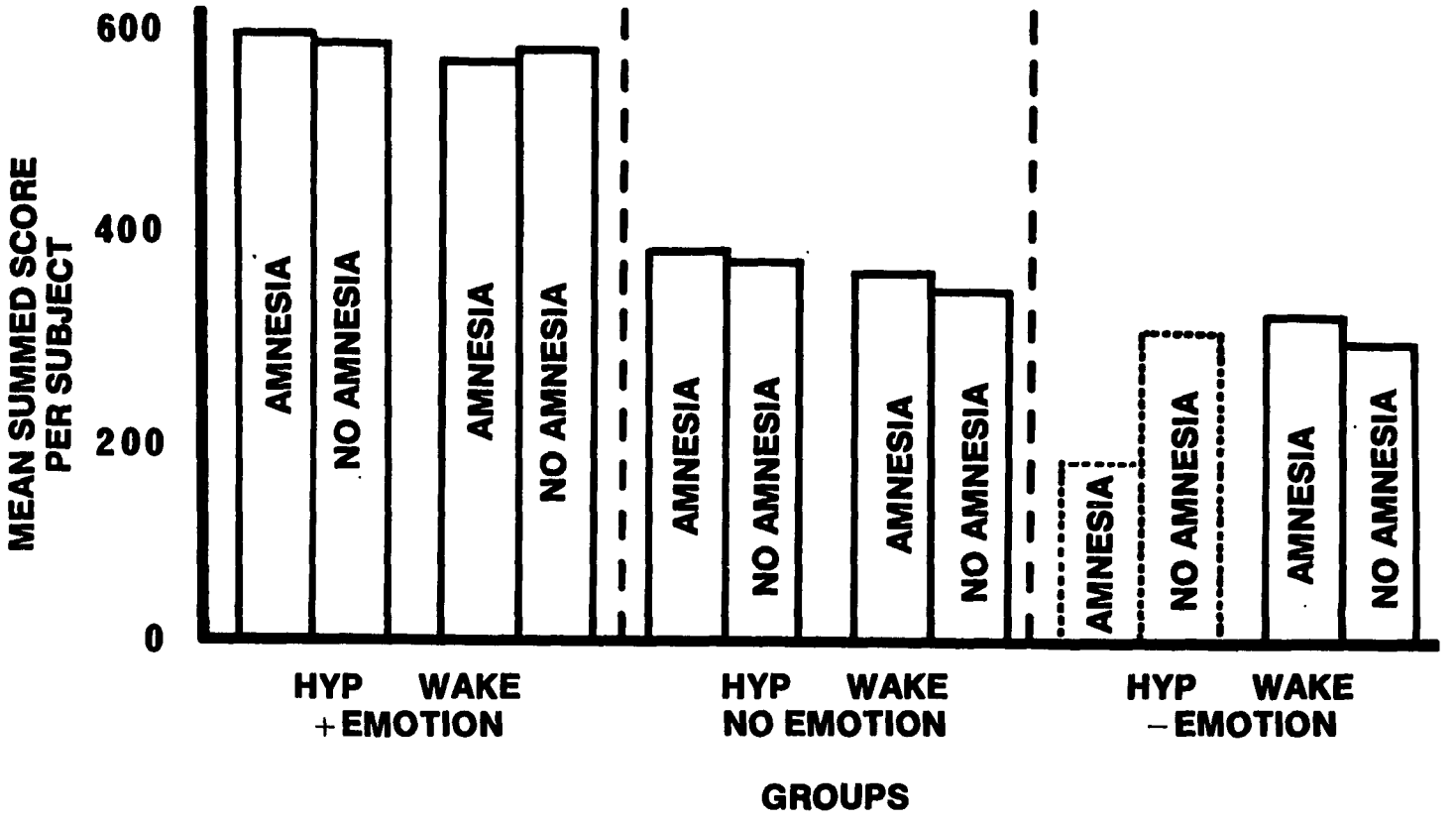


Figure 6. Results of the amnesia procedure.

Results from a followup questionnaire indicated that the amnesia procedure had not always been successful (see Table 18). They suggested that the only appropriate comparison of the amnesia-no amnesia distinction was between the two groups of hypnotic subjects instructed to experience negative emotions (see Figure 6). A t-test (Garrett, 1958) between these two groups showed that individuals in the amnesia group rated the music lower than members of the corresponding no amnesia condition ($p < .05$). This suggests that unlike those in the no amnesia condition subjects in the amnesia group either suppressed, or forgot, the fact that the yellow light rather than the music was eliciting their unpleasant emotional reactions, and consequently mistakenly judged the music to be unpleasant. It seems unlikely that subjects in the amnesia groups were merely pretending to forget about the role of the yellow light since they presumably could not have known how the experimenter would have expected them to judge the music in such a case.

A t-test between the negative emotion no amnesia groups and the no emotion control groups was not statistically significant (see Figure 6). This indicated that judgements by subjects instructed to experience negative emotions and to be aware that the yellow light was causing them to do so were not significantly affected in their judgements of the music.

In the case of subjects instructed to experience positive emotions and analogous t-test was significant ($p < .05$).

These subjects were aware that the yellow light rather than the music was responsible for their feelings. Nevertheless, their evaluations of the music were still influenced, apparently as a consequence of the "emotion producing" directions they received. This suggests that emotions may sometimes interfere with, or otherwise affect, one's ability to make evaluations even when one is aware that those feelings are irrelevant. It also implies that persons tend to favorably evaluate attributes of objects, or individuals, in whose presence they experience positive feelings.

Table 16 summarizes the effects of the amnesia procedure in influencing how the tune was rated.

Table 16

Summary of How the Music was Rated
Relative to the Control Group Ratings

Group	Rating of Music (Relative to Control Group Ratings)	Status
Negative Emotion No Amnesia Group	Rated Music Neutral (ie., same as controls)	Knew light (rather than music) was eliciting negative emotions
Negative Emotion Amnesia Group	Rated Music Unfavorably	Did not know light (rather than music) was eliciting negative emotions
Positive Emotion No Amnesia	Rated Music Favorably	Knew light (rather than music) was eliciting positive emotions
Positive Emotion Amnesia Group	Rated Music Favorably	Did not know light (rather than music) was eliciting positive emotions

Hypnotic Vs. Waking Procedure

In order to determine whether the subjects' evaluations reflected differences between the hypnotic and waking procedures two Duncan tests were performed. These tested for differences among the waking, hypnotic, and control groups. One test was performed upon the positive group data and the other upon the negative group data. For this purpose the amnesia - no amnesia distinction was ignored. Table 17 summarizes these data.

Table 17

Effect of Hypnotic, Waking, and Control Procedures on Evaluations of the Music

Positive Emotion Hypnotic Group	Positive Emotion Waking Group	Positive Emotion Control Group
586.5	560.1	391.5
Negative Emotion Hypnotic Group	Negative Emotion Waking Group	Negative Emotion Control Group
258.1	320.8	383.3

Scores = mean overall rating of the music by each group.

In the case of the positive emotion condition no significant differences were found between the waking and hypnotic

groups. Both groups differed from the appropriate control ($p < .05$).

In the case of the negative emotion groups, hypnotic subjects rated the tune significantly lower than control subjects ($p < .05$). Waking subjects did not.[2]

Results of the Followup Questionnaire

One week following their experimental sessions subjects were mailed a questionnaire upon which to provide their comments, especially about why they rated the tune as they did, and upon which they were asked three questions. The questions and results are presented in Table 18 on the next page. It was assumed that if a subject answered "No" to the third question in the table the amnesia inducing procedure was successful. In examining question 2

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2. An analysis of variance (see Table 33) failed to show a statistically significant difference between the waking and hypnotic procedures. This may have been so because in performing that analysis data from the no emotion control groups had to be classified as either hypnotic or waking group data even though no treatment instrucitons had been presented to subjects in the control conditions. This procedure may have masked any differences that occurred between the waking and hypnotic groups. That there were no significant statistical interactions (see Table 33) may have been due to the fact that the predicted effects for the positive and negative emotion conditions were opposite in direction and could have cancelled one another out. It is possible, then, that under these circumstances the number of subjects in this study was too small to show a significant higher order effect.

Table 18

Results of the Questionnaire from Experiment 3

Group	Type of Treatment		Subjects &HGS Scores	YES	NO	YES	NO	YES	NO	Total Score
Positive Emotions		Amnesia	BMH (12)	X		X		X		605
			FRS (8)	X		X			X	593
			ADR (11)	X			X		X	530
			SEL (9)	X		X		X		683
			DES (8)	X		X		X		567
		No Amnesia	MST (11)	X		X			X	659
			WOD (10)	X			X		X	634
			LOR (10)	X			X		X	476
			STT (8)	X		X		X		488
			HEN (8)	X		X		X		630
	Waking	Amnesia	MOR (8)	X		X		X		734
			HUH (10)		X		X	X		645
			TMN (9)	X		X			X	515
			WIS (11)		X		X	X		352
			KIL (9)	X		X		X		554
		NO Amnesia	MTS (10)	X		X		X		581
			NER (8)	X		X		X		428
			SHS (9)		X		X	X		657
			TAY (8)	X		X		X		657
			COT (8)	X		X		X		478
Negative Emotions	Hypnosis	Amnesia	SEN (11)	X		X			X	201
			FYF (11)	X			X		X	191
			MON (10)	X			X		X	176
			CLK (8)	X		X			X	163
			YOR (8)	X		X			X	199
		No Amnesia	BAZ (8)	X		X		X		354
			LEW (11)	X		X		X		453
			HIL (9)	X			X	X		214
			RAN (8)	X		X		X		203
			IKR (8)	X		X		X		427
	Waking	Amnesia	BSK (11)		X		X	X		351
			RON (8)		X		X	X		465
			SIH (10)		X		X	X		305
			EAL (9)	X		X		X		296
			EAS (9)	X		X		X		277
		No Amnesia	MAH (9)		X		X	X		217
			MRD (10)	X		X		X		301
			STR (10)	X		X		X		558
			TLK (10)	X		X		X		236
			SES (8)		X		X	X		202
*Control data not included.				Subjects Responses					Amnesia----------→	

Question 1. - When instructed during your last experimental session to experience emotions were you able to do so?

Question 2. - When rating the musical tune at the conclusion of your last experimental session and the yellow light was turned on, were you aware of experiencing any particular feelings?

Question 3. - When the yellow light was turned on, at that time did you remember having been told that when it was on it would cause you to experience certain emotions?

one should recall that if a subject reported experiencing emotions (whether he actually did so is sometimes a moot point) normally he would be expected to react towards the stimulus he believed responsible for them in accordance with the ideas presented earlier. Situations in which individuals do not acknowledge the existence of particular emotions can also lead to observable effects under some circumstances.

Copies of the questionnaires used in the three studies reported here can be found in Appendix C. Appendix E contains a discussion of some implications of these studies and Appendix F outlines a partial theory of learning and performance to which they can be related.

Results from the followup questionnaire provided a good deal of information. A number of subjects, in response to the first question, reported that they failed to experience emotions when originally instructed to do so. This raises the possibility that evaluations made by some individuals may have been uneffected simply because they were not experiencing the suggested emotions. Visual examination of the data indicated that even if this is true none of the major conclusions reached earlier need be changed.

That subjects in the amnesia groups apparently were able to remember enough to respond properly to the first question

suggests (a) amnesia instructions only affected memory about the yellow light, or (b) memories about what transpired throughout their treatment sessions subsequently returned.

In many cases a subject's report about whether he experienced amnesia was not in accord with the procedures performed. Consequently, the conclusion concerning failure to find a significant difference between hypnotic subjects in the positive emotion amnesia and no amnesia groups was placed in doubt. However, an anlaysis of these two groups where subjects were dichotomized as amnesia or no amnesia on the basis of their own subjective responses produced the same results as the earlier one based upon the procedural distinction between these two conditions.

The finding that amnesia instructions had not always been effective suggested that the only legitimate comparison of the amnesia and no amnesia conditions was between the two groups of hypnotic subjects who received directions to experience negative emotions. This was true because these two were the only paired groups for which the operational definition of amnesia and the subjects' reports about the success of that procedure were in agreement.

Table 18 indicates that in the case of the negative emotion condition the hypnotic instructions were superior to the waking in intentionally producing amnesia (sign test. $p < .05$. Hays, 1963). The hypnotic technique was not statistically superior to the waking in intentionally producing amnesia in

the case of the positive emotion condition (see Table 18). When the distinction between positive and negative emotions was ignored a chi square test (Siegal, 1956) indicated that the hypnotic procedure was superior ($p < .05$). This fails to support Barber's (1967) suggestion that properly administered waking instructions may be as effective as hypnotic intructions in inducing amnesia. These results could conceivably have been partly a function of the waking subjects failing to respond adequately to the "expectancy procedure".

In examining Table 18 it can be noted that some subjects reported experiencing feelings when the music was being played but said that they were not aware that the yellow light was responsible for them. If the yellow light was the eliciting emotional agent this implies that a distinction can be made between (a) Whether a subject is aware of a particular feeling, and (b) whether he is aware of that feeling's source and its significance. That is, these subjects were apparently aware of experiencing the suggested feelings, but they were apparently unaware of the role the yellow light (which was the source of those feelings) was playing in eliciting them.

Two subjects who received hypnotic instructions to experience negative emotions reported that they were not aware of feelings when listening to the music. Still, they rated it quite poor. If one assumes that their ratings were due

to the fact that they were indeed experiencing the suggested negative emotions this raises the possibility that their behaviors may have been influenced by feelings not cognitively recognized at the time. That noncognitive emotional reactions can affect behavior (Freud, 1938) may help account for much seemingly irrational activity.

This investigation demonstrated the use of an induction and questionnaire procedure which can possibly be further developed to facilitate studying noncognitive emotional processes. Results from the questionnaire suggested that behavior can be effected by emotions (1) in spite of one's failure to be cognitively aware of their existence (see question 2, Table 18), and (2) in spite of one's failure to be cognitively aware of the function of the stimulus (in this case the yellow light) responsible for eliciting them.

Discussion

Attitudes about the music by subjects instructed to experience positive emotions were for the most part favorable relative to those of the controls. This was so regardless of whether or not they reported being aware of the stimulus (ie., the yellow light) responsible for their feelings. As pointed out earlier, this suggests that some emotions may be able to influence one's opinions simply by being present. On the

other hand, these results could have been at least partially a function of the demand characteristics and social pressures discussed earlier.

In the case of subjects hypnotically instructed to experience negative emotions, those who reported being unaware of the stimulus (ie., the yellow light) responsible for their feelings mistakenly attributed them to the music and consequently judged the music accordingly. Those who reported that they realized the yellow light was responsible for their feelings apparently judged the music in accordance with their own individual preferences, and in accordance with the stimulus dimensions of the tune and the abilities of the musicians who played it.

All subjects were consistent in that their evaluations of the music correlated with their statements about whether they would buy or play it (see Table 15). Those statements supported the expectation that persons would avoid situations involving negative affect, but gravitate towards those involving positive feelings.

Even though the results disclosed correlations between the subjects' behaviors and their operationally induced emotions such correlations do not prove that emotionality was a causal factor.

Demand Characteristics

Even though almost all subjects stated that they rated the tune objectively rather than trying to please the experimenter, it was not possible to rule out the role of social pressures in bringing about some of the results. The observed difference between the amnesia and no amnesia groups suggests, however, that the results were not entirely a function of such pressures because it is unlikely that subjects (who were unaware of each others performance) could have guessed that the experimenter expected them to respond in such a fashion to the amnesia procedure.

Some subjects failed to make the predicted response to the first question of the evaluation form. Here again they were apparently not responding so as to try to please the experimenter. Many subjects reported being unable to carry out certain suggestions. In such instances they failed to comply with the experimenter's expectations.

Results of this study lent support to the suggestion, then, that emotions operationally defined and induced by experimental manipulation will follow the same rules as feelings aroused in other ways.

Subjects' Comments

Many subjects reported pertinent observations on the questionnaires. One commented that when the yellow light

had been turned on it had annoyed and distracted him and interfered with his subsequently judging the music properly. This suggested that in some instances the induced emotions may have produced an effect by interfering with the attentional, discriminatory, and perceptual processes of the subject doing the rating. Consequently, some evaluations may not have been a direct function of feelings that the subjects were presumably experiencing. However, this could not have accounted for the differential effect produced by the positive and negative emotion instructions.

One subject reported there was a yellow porch light outside her home and every time she looked at it during the first week or so following her experimental session she experienced the emotions suggested to her. This indicated that there apparently was generalization of the induced emotions and that it might have been possible to classically condition other stimuli to them.

In general there were no surprising reports by subjects about their experiences when the music was being played. Some in the negative emotion groups reported they felt annoyed and unable to enjoy it. One noted it did not seem good and she kept wishing it would end. Another said the melody gradually became the type she did not like. It will be recalled that subjects in the negative emotion groups had been told that

the unpleasant feelings would become more intense as long as the yellow light was on.

Some subjects in the positive emotion groups indicated that when listening to the recording they felt pleasant and exhilerated. One described her sensation as a "light bubbly" feeling, while stating she had not tried to make herself feel that way. She noted she realized the music would not normally have "turned her on", but it did at that time and so she rated it accordingly. This indicated she was able to discriminate between her customary opinion of the music and her opinion of it at a given time. Although in accord with the theoretical expectations outlined earlier, this suggested that a differently phrased questionnaire might have yielded different evaluations.

Some individuals indicated they spontaneously experienced the suggested emotions at various times throughout the first week or so following their experimental sessions. One could speculate that an eliciting stimulus might have been present without their being aware of it.

A few individuals said they experienced unusual occurrences during hypnotic induction. One stated that when told to go into a deeper trance he pictured himself next to a dark hole. He said he imagined himself trying to jump in but could never make it. Another reported that when the hypnotist stated "Pay attention only to my voice" the radiator in the

experimental room made a noise. He stated that subsequently whenever the hypnotist said "Pay attention only to my voice" he would repeat to himself "and also to the sound of the radiator".

This may provide evidence of one way individuals can change their behavior to prevent cognitive conflicts or disparity from developing, thereby avoiding anxiety (eg., Festinger, 1957; Esterbrooks, 1957). In other words, the subject had been told by the experimenter to pay attention only to him. However, he inadvertently disobeyed. Since he presumably felt an urge to comply with the hypnotist he apparently imagined he told him to do what he had already just done. Admittedly other interpretations are possible and any after the fact analysis must be considered only tentative conjecture until its validity can be tested.

Finally, it might be noted that this experiment demonstrated that emotions may be able to distort one's view of reality. That is, the subjects' own emotions apparently affected their judgements about the quality of the music. Such occurrences may be a common feature of emotionally mediated beliefs. Believing something or feeling something, however, does not necessarily mean one is correct any more than "feeling good" when listening to the music meant the tune <u>actually</u> possessed particular intrinsic qualities of its own.

Many ideas presented in this chapter and in the Appendices at the conclusion of this paper are amenable to testing by extensions of the methods demonstrated here (eg., Blum, 1967; Reyher, 1967; Wells, 1965). It may be possible, for example, to use an extension of the present approach to alter some types of maladaptive psychological activities. Certainly many clinical problems involve emotional difficulties, and if the present procedures can help persons learn better control of their feelings they may prove of significant therapeutic as well as research value. Studying emotional functioning and its relationship to behavior is an important practical problem, and the techniques demonstrated here afford one possible avenue for carrying out the necessary research.

Chapter 5

RESUME AND THERAPEUTIC INFERENCES

All three experiments provided information about how successful changes in behavior may be achieved.

Results of the first experiment showed that hypnosis can be used to facilitate partial extinction of a previously learned habit. They also indicated that "trance inducing" procedures can be important as a prerequisite to achieving behavioral change and they suggested that the Harvard Group Scale of Hypnotic Susceptibility can be used as a therapeutic prognosticator.

The second study indicated that hypnotic techniques can help institute new forms of responding and it showed that behaviors initiated in such a fashion can resist extinction. It indicated that suggestions making no reference to affect can result in behavioral changes, although subjects' comments suggested that emotions had still been a factor.

The third experiment showed that hypnotic and waking suggestions can be used to influence opinions.

The present studies indicated that emotions can help regulate behavior. While common sense suggests that this is the case they also accomplished something more. The methods

employed in the first investigation were designed to teach individuals to bring their feelings, which normally are involuntarily aroused, under experimental control (Massett, 1970). This was to enable them to alter their behavior in ways they might have found difficult had they had to use their "will power" to try to inhibit their feelings. Thus, those methods were designed to allow them to learn to regulate their behavior in such a way as to operate in their own best interests rather than against them. Teaching persons to achieve control of their feelings and behaviors can be an important therapeutic goal.

Although more research is necessary before concluding that the techniques used here have the potential for achieving significant therapeutic change, a basis has been presented then for exploration of such a possibility. The remainder of this paper will compare the theoretical rationale of techniques of the type used here and other therapeutic procedures. The present experiments demonstrated a method for achieving behavioral change. To examine the theoretical basis of that method no decision need be made as to whether such changes ought to be termed therapuetic.

Much of the remainder of this chapter examines the possibility of employing techniques of the type used here in order to change behavior. In theory such an approach involves classically conditioning experimentally generated emotions to

various activities in order to motivate subjects to change their frequency of occurrence. In recommending that further investigations of the present procedures be carried out the writer is not suggesting that new evidence now exists for using hypnosis as it has often been employed for the supposed purposes of dream analysis, age regression, uncovering of repressed memories, and so on.

Hypnosis has often been tried in the past as a therapeutic procedure and some therapists still advocate its use even at present (eg., Wolberg, 1964). There is very little evidence, however, that hypnotic procedures can induce long term and meaningful behavioral changes, and it is not being suggested here that the current studies have provided additional evidence to alter that situation.

What is being suggested here is that procedures of the present type have not yet been fully explored in terms of their potential for achieving significant behavioral change, and thus more research along these lines seems warrented. In the remainder of this chapter when reference is made to possible future uses of hypnotic procedures such references refer only to procedures of the type used here. In fact, one need not even accept the term hypnosis. All that is really being suggested is that the possibility of employing procedures that are designed to help subjects better control

their emotions, and associated behaviors, should be further examined.

Comparison of Behavior Therapy, Psychoanalysis, and the Present Techniques

Techniques of the type used in the first study may have certain advantages when compared with traditional behavior therapy (eg., Bucher & Lovass, 1968). For example, in aversion therapy (Wolpe, Salter & Reyna, 1966) the patient leaves the clinic knowing that the agents responsible for eliciting his feelings are no longer active. That is, if a subject is shocked or otherwise punished for smoking (Franks, Fried & Ashem, 1966; Powell & Azrin, 1968) he knows that he will no longer be shocked once he removes himself from the therapeutic situation. When procedures like those in the first experiment are used, however, subjects have no *a priori* basis for believing that they will not continue to feel discomfort if they smoke.

Techniques of the type demonstrated in the three experiments can enable a therapist to elicit and make use of many more emotions than can be aroused when traditional behavior therapy is employed and this can allow him to compare the behavioral and biophysical effects of emotions (Kline & Linder, 1969; Brady, 1968). Those techniques also enable a therapist to tell a patient that he should feel in particular

ways when thinking particular thoughts (Velton, 1968; Lazarus & Abramovitz, 1962). None of the traditional behavior therapy techniques stress such an approach.

The techniques used in the first study were devised to try to enable subjects to feel relaxed when not smoking. These techniques may be superior to relaxation therapy (Jacobson, 1938) in that they can be designed to try to help patients rid themselves of subjectively unpleasant emotions. The present techniques, then, are better able to deal with the covert mechanisms that mediate between behavior and its environmental causes than are most behavior therapy procedures.

Techniques of the type demonstrated here may also have advantages compared to psychoanalysis. Proponants of psychodynamic theory have criticized such treatment procedures because they feel they deal only with symptoms (Rapaport, 1967). Most would undoubtedly consider cigarette smoking a symptom and would maintain that treatment of the type used in the first study results in replacement of one symptom or behavior by another. Behavioral substitution, when and if it takes place, however, (Hussain, 1966) can be desirable if maladaptive behaviors are replaced by more adaptive ones. Certainly many persons are able to stop smoking without experiencing more serious problems and this is in accord with the theoretical

expectations of the procedures used here. On the other hand, there are situations where "symptomatic" treatment would be undesirable as, for example, if one were to attempt to decondition hallucinations or dreams resulting from an overdose of LSD or from faulty biological functioning.

The procedures used in the first experiment were more direct than most psychodynamic approaches would have been in trying to help subjects reduce smoking. Such procedures would very likely be more direct in most other instances also. Freud (1936), for example, noted that to experience repressed emotions may facilitate behavioral change. This makes sense because a previously learned behavior would often be expected to extinguish only if the emotional response being avoided occurred and dissipated in the presence of its eliciting stimulus (Solomon & Wynne, 1954; Kamin, Brimer & Black, 1963). Techniques of the type used in the first experiment might not discover the cause for association between a behavior (such as cigarette smoking) and emotions as Freud's methods might. However, such uncovering may not always be necessary. It may often be less important to ask why a particular feeling or behavior has occurred than to ask what can be done about it. It may sometimes be possible to associate new emotions with given behaviors, or to extinguish them, without having to consider what emotions were previously present (Watson & Rayner, 1920; Wolpe, 1958).

Cognitive versus Emotional Control

Freudian psychology emphasizes the concept of insight (Paul, 1966; Freud, 1953). The results of the third experiment suggest that while insight may sometimes enable persons to attain control over their emotions and associated activities, possessing such knowledge is not always enough to influence subsequent behavioral change. Insight might be helpful if a person was also able to experience and extinguish his feelings or make a response so as to do something about them.

People do not normally decide before hand that they want to have particular feelings. A person may know it is inappropriate to feel, or not to feel in a certain way and he may even understand the reasons for his emotions having been aroused. In addition he may state that he does not want to feel as he does. In spite of possessing such knowledge, and in spite of his avowed desires to the contrary, he may involuntarily go on feeling the same way while thinking and reacting accordingly. Apparently a person can react in a passive fashion in response to his emotions or he can actively direct his own behavior. It is an important task for future research to determine the circumstances under which any emotion (including a hypnotically induced one) will take precedence over cognitive factors and when the converse situation will be the case.

Presumably the induced emotions began to extinguish towards the conclusion of the first experiment when a number of subjects showed a partial relapse in cigarette smoking. Possibly if those emotions had been more aversive, or qualitatively different, the subjects might have altered their performance more dramatically and for a longer period of time. On the other hand, had the drives opposing the cessation of smoking been stronger the induced emotions might have been suppressed or extinguished more rapidly. Such propositions are, of course, testable.

Results of the first study suggested that although persons are aware that smoking is deleterious to their health, they can ignore or deny that knowledge while allowing the relatively pleasurable emotions associated with smoking, or the unpleasant ones associated with not doing so, to take precedence in determining their behavior.

Limitations of Hypnotic Procedures

The methods demonstrated here may suffer from procedural limitations. This is so because it is not clear what the unconditioned emotional stimulus is in the typical hypnotic situation. Similarly, it is not clear how, one could prevent emotions from extinguishing in the absence of such a stimulus. Possibly other rewards of an environmental or intrinsic nature

could play a role in this connection. An individual no longer experiencing hypnotically induced feelings of pleasure for dieting might still refrain from overeating because of the intrinsic satisfaction associated with knowing he had already lost weight.

The problem of accounting for continuation of experimentally induced emotionally mediated behaviors is not as great when avoidance learning is involved as when positive emotions must be maintained (Solomon & Wynne, 1954).

The matter of stipulating the unconditioned stimulus is important. This is so because the presence of such a stimulus is necessary, at least with positively mediated activities, if permanent changes in behavior are to be achieved (Kimble, 1961). A hungry animal trained to press a bar in exchange for poker chips with which he can obtain food may stop bar pressing if food (ie., the Pavlovian unconditioned stimulus) is no longer available. Thus, theoretically, some unconditioned stimulus of either an internal or external nature must be present which can continue to afford positive emotional feedback if behavior is to be indefinitely directed by positive feelings. In the absence of such an unconditioned agent those feelings may extinguish. In the case of hypnotically generated emotions it is not clear whether such an agent is present and, if so, it is not obvious what its exact nature may be. This is an

important point because the present series of studies attempted to use hypnosis as a means for classically conditioning particular emotions to particular behaviors in order to alter the frequency of those behaviors. This assumes that a classical conditioning paradigm involving hypnosis can be established (Salter, 1955), and therefore requires that the unconditioned stimulus be properly defined.

Hypnotic procedures also have other limitations. In the second experiment, for example, "hypnosis" was used to enable subjects to learn a new response. Some behaviors, however, can come about because of an inability to learn properly or because of unlearned, biological, or imprinted factors (Hess, 1966; Festinger, 1957; Sourkes, 1966; Taylor, 1968; Selye, 1960). Techniques of the type demonstrated here depend upon relearning and they cannot be expected to correct malfunctioning processes involving perception, attention, consolidation, and so on.

The effects of the second experiment were neither long lasting nor dramatic. This suggests that the methods proposed here may suffer from even more serious limitations. It should be remembered, though, that the experimenter spent very little time with each subject and greater effort might have resulted in more profound consequences. Ultimately, questions about the limits of the present approach will have

to be answered experimentally, or by carefully controlled observations.

The procedures demonstrated here are not being advocated as a ubiquitous panacea for use in psychiatric treatment. Instead, in any given instance various psychological factors and biological constraints can oppose intended therapeutic manipulations. Although statistical control procedures were employed to handle this difficulty with respect to the research interests of the present studies, selection of the best forms of treatment must be a function of the individual case in question. Many persons might react adversely against treatment of the kind suggested here because of its apparent impersonal or meahanistic nature. On the other hand, sometimes talking a problem over with a friend can help a person to feel better, or differently, to rechannel his anxieties, and to cope with life's problems more adequately. Sometimes a person may even be better off working his problems out on his own. Certainly the value of many traditional therapies and theories can be questioned (eg., Thigpen & Cleckley, 1966; Eysenck, 1961; Szasz, 1960; Payne, 1953; Menninger, 1968; Phillips & Wiener, 1966). One must revise and interpret a theory in the light of observed behaviour and not vice versa.

The methods demonstrated in the present experiments were designed to elicit emotional reactions, and to employ

stimulus and response substitution, to bring about cognitive and behavioral changes. This is not the only method possible since several forms of therapy institute cognitive and environmental changes to bring about emotional and behavioral alterations (eg., Hingten, Saunders & Demyer, 1966; Mowrer, 1965; Masserman, 1943).

Even though the role of emotions as an important therapeutic variable has been stressed, it may also be possible to teach persons to think differently or more logically (Glasser, 1965).

Possible Uses of the Present Procedures

Although the methods demonstrated here are not recommended as treatment for all psychological disturbances, various extensions of these methods may be of value. Such a proposition should be explored in connection with certain addictions, sexual anomolies, insomnia, stuttering, anxiety reactions and so on. Procedures of the type proposed here may be of special assistance in cases involving extremes of emotional discomfort where punishing the observable behavior would be of little use. For example, one could not expect to prevent suicide by punishing that response. However, the proposed techniques might be able to bring about sufficient relief from emotional suffering to be of benefit.

Individuals who complain that life is meaningless though, would likely also require a more personable approach.

Although an extension of the present approach can possibly be employed to achieve certain types of therapeutic changes a word or caution must be sounded. Studies have been reported in which aversion therapy methods were used to "treat" unwanted homosexuality, alcoholism, and so on (Ullmann & Krasner, 1966). In some such cases, however, serious side effects involving depression and anxiety have been observed. It may be possible to use extensions of the methods demonstrated here to test for resultant feelings and behaviors in response to experimentally induced, or situationally depicted, conflicts (Gordon, 1967).

Preceding sections of this chapter were primarily concerned with comparing the theoretical basis of the methods demonstrated here with other techniques designed to achieve therapeutic change. One must distinguish, however, a method from the theory upon which it is based. Because a psychoanalyst brings about improvement in a schizophrenic does not necessarily prove that that analyst's theoretical framework is correct or that his method is best (Marmor, 1962). Likewise, the fact that persons labeled schizophrenic may learn to behave in "nonschizophrenic" ways does not prove that learning factors alone were responsible for bringing about their psychotic behavior in the first place. The popularity of a method based upon prevailing theory does

not assure its effectiveness. Bleeding sick patients was once a popular medical method based upon faulty theory and many other similar examples could be cited. Therefore, not only must one insure the logic of any given psychodynamic theory, but one must also see to it that independent valid tests are made of the outcome of any therapeutic procedures based upon such a theory.

It must be emphasized that one cannot determine the effectiveness of a therapeutic procedure by resorting to academic arguments. Instead, one must carefully examine the effects, and antecedent conditions, of any therapeutic change. This must be done objectively although the therapy itself need not be mechanical.

The best forms of "treatment" are not necessarily the easiest or most intensive. It is not just how hard the patient works and the therapist tries, or how good their intentions are that counts. Nor is it only a matter of how rational or humanistic the therapists theories seem to be. Instead, it is what is accomplished on the patient's behalf that is of significance. Psychoanalysis, hypnosis, existenialism, and so on can be quite appealing in theory but this alone does not mean that they work as therapy. The professed accomplishments of any therapy must be carefully scrutinized by using properly

controlled procedures (Beckman, 1970), possibly of the type employed in the present investigations.

Finally, it should be noted that some psychologists (eg., Skinner, 1965) have posed questions about whether a worthwhile purpose is served by postulating the existence of certain phenomenon. In the case of concepts such as thinking and emotions such questioning seems unwarranted. People do think and they do have feelings and the important question is not whether it is necessary to postulate that this is so. Instead one can attempt to determine how such processes, and the relationships amongst them, can best be defined, described, and studied, as well as explained, anticipated, and controlled. It would seem that methods of the type demonstrated here may be able to help contribute to such an end.

REFERENCES

Atkinson, J. W. An Introduction to Motivation. New York: Van Nostrand, 1964.

Barber, T. X. The necessary and sufficient conditions for hypnotic behavior. American Journal of Clinical Hypnosis, 1960, 3, 31-34.

Barber, T. X. Towards a theory of hypnosis: posthypnotic behavior. Archives of General Psychiatry, 1962, 7, 321-342.

Barber, T. X. A critique of experimental methods. In J. Gordon (ed.), Handbook of Clinical and Experimental Hypnosis. New York: Macmillan, 1967.

Barber, T. X. Hypnosis: A Scientific Approach, New York: Van Nostrand, 1969.

Beckman, L. Teachers take credit. Science News, 1970, 97, 332.

Berecz, J. M. The modification of smoking behavior through self-administered punishment of imagined behavior. Unpublished doctoral dissertation, Indiana University, 1970.

Bernstein, D. A. The modification of smoking behavior: an evaluative review. Psychological Bulletin, 1969, 71, 418-440.

Blum, G. S. Hypnosis in psychodynamic research. In J. Gordon (ed.), Handbook of Clinical and Experimental Hypnosis. New York: Macmillan, 1967.

Brady, J. V. Emotion and the sensitivity of psychoendocrine systems. In D. Glass (ed.), Neurophysiology and Emotion. New York: Rockefeller University Press, 1968.

Bronowski, J. and Bellugi, U. Language, name, and concept. Science, 1970, 168, 669-673.

Bucher, B. and Lovaas, O.I. Use of aversive stimulation in behavior and modification. In M. R. Jones (ed.), Aversive Stimulation. Florida: University of Miami Press, 1968.

Buss, A. H. The Psychology of Aggression. New York: Wiley, 1963.

Chaves, J. F. Hypnosis reconceptualized: an overview of Barber's theoretical and empirical work. Psychological Reports, 1968, 22, 587-608.

Clawson, T. A. Hypnosis in medical practise. American Journal of Clinical Hypnosis, 1964, 6, 232-236.

Coch, L. and French, J. Overcoming resistance to change. In D. Cartwright and A. Zander (eds.), Group Dynamics. Evanston: Row and Peterson, 1960, 318-341.

Coyne, J. Can hypnosis help? Psychology Today, 1968, 2, 45-49.

Cruickshank, A. The anti-smoking clinic. Lancet, 1963, 2, 353-354.

Dalgado, J., Roberts, W. and Miller, N. E. Learning motivated by electrical stimulation of the brain. American Journal of Physiology, 1954, 179, 587-593.

Dethier, V. G. and Stellar, E. Animal behavior: its evolutionary and neurological basis. Englewood Cliffs: Prentice-Hall, 1961.

Edwards, G. Hypnosis and lobeline in an anti-smoking clinic. Medical Officer, 1964, 111, 239-243.

Egger, M. D. and Flynn, J. P. Amygdaloid suppression of hypothalamically elicited attack behavior. Science, 1962, 136, 43-44.

Ejrup, B. Treatment of tobacco addiction: experiences in tobacco withdrawal clinics. In Can We Help Them Stop? American Cancer Society, Illinois division, 1964, 3-17.

Erickson, M. H. The burden of responsibility in effective psychotherapy. American Journal of Clinical Hypnosis, 1964, 6, 269-271.

Esterbrooks, G. H. Hypnotism. New York: E. P. Dutton Co., 1957.

Eysenck, H. J. The effects of psychotherapy. In H. J. Eysenck (ed.), Handbook of Abnormal Psychology. New York: Basic Books, 1961.

Ferguson, G. A. Statistical Analysis in Psychology and Education. New York: McGraw-Hill, 1959.

Festinger, L. A. A Theory of Cognitive Dissonance. California: Stanford University Press, 1957.

Fisher, A. E. and Coury, J. N. Cholinergic tracing of a central neural circuit underlying the thirst drive. Science, 1962, 138, 691-693.

Fowler, H. Curiosity and Exploratory Behavior. New York: Macmillan, 1965.

Franks, C. M., Fried, R. and Ashem, B. An improved apparatus for the aversive conditioning of cigarette smokers. Behavior Research and Therapy, 1966, 4, 301-308.

Freud, S. Inhibitions, Symptoms, and Anxiety. London: Hogarth Press, 1936. (First German edition, 1926).

Freud, S. The psychopathology of Everyday Life. In The Basic Writings of Sigmund Freud. New York: Random House, 1938. (First German edition, 1904).

Freud, S. The Standard Edition of the Complete Psychological Works. J. Strachey (ed.), London: Hogarth Press, 1953.

Gardner, E. Fundamentals of Neurology. Philadelphia: Saunders, 1963.

Garrett, H. Statistics in Psychology and Education. New York: David McKay, 1958.

Gellhorn, E. and Loofbourrow, G. N. Emotions and Emotional Disorders. New York: Harper, 1963.

Gidro-Frank, L. and Bull, N. Emotions induced and studied in hypnotic subjects. Journal of Nervous and Mental Disorders, 1950, 3, 91-100.

Gill, M. and Brenman, M. Hypnosis and Related States. New York: International University Press, 1963.

Glasser, W. Reality Therapy. New York: Harper and Row, 1965.

Gordon, J. E. Hypnosis in research on psychotherapy. In J. Gordon (ed.), Handbook of Clinical and Experimental Hypnosis. New York: Macmillan, 1967.

Gould, W. L. Use of a lozenge to curb smoking appeal. GP, 1953, 7, 53-54.

Graff, H., Hammett, J. B. O. and Bash, N. Results of four anti-smoking therapy methods. Pennsylvania Medical Journal, 1966, 69, 39-43.

Harper, R., Anderson, C., Christensen, C. and Hunka, S. (eds.), The Cognitive Processes. Englewood Cliffs: Prentice-Hall, 1964.

Hays, W. L. Statistics for Psychologists. New York: Holt, Rinehart and Winston, 1963.

Helson, H. Adaptation level theory. In S. Koch (ed.), Psychology a study of science. New York: McGraw-Hill, 1959, 565-621.

Hess, E. H. Imprinting in animals. In J. McGaugh, N. Weinberger and R. Whalen (eds.), The Biological Basis of Behavior. New York: W. H. Freeman, 1966.

Hilgard, E. R. Individual differences in hypnotizability. In J. Gordon (ed.), Handbook of Clinical and Experimental Hypnosis. New York: Macmillan, 1967.

Hilgard, E. R., Weitzenhoffer, A. M. and Gough, P. Individual differences in suscepibility to hypnosis. Proceedings of the National Academy of Science, 1958, 44, 1255-1259.

Hingten, B., Saunders, B. and Demyer, M. Shaping cooperative responses in early childhood schizophrenics. In L.P. Ullmann and L. Krasner (eds.), Case Studies in Behavior Modification. New York: Holt, Rinehart and Winston, 1966.

Homme, L. E. Perspectives in psychology, control of coverants, the operants of the mind. Psychological Record, 1965, 15, 501-511

Hoinville, G. W. and Biggs, H. W. Establishing smoking habits in retrospect. The Statistician, 1966, 16, 23-43.

Hoskovec, J. A review of some major works in Soviet Hypnotherapy. The International Journal of Clinical and Experimental Hypnosis, 1967, 15, 1-10.

Hull, C. L. Principles of Behavior. New York: Appleton Century Crofts, 1943.

Hussain, A. Behavior therapy using hypnosis. In J. Wolpe, A. Salter, and L. J. Reyna (eds.), The Conditioning Therapies. New York: Holt, Rinehart and Winston, 1966.

Inglis, J. Abnormalities of motivation and "ego-functions". In H. J. Eysenck (ed.), Handbook of Abnormal Psychology. New York: Basic Books, 1961.

Jacobson, E. Progressive Relaxation. Chicago: University of Chicago Press, 1938.

Johnson, E. The use of hypnosis in modification of smoking behavior. Unpublished thesis in rehabilitation psychology, University of Portland, 1970.

Kamin, L. J., Brimer, C. J. and Black, A. H. Conditioned suppression as a monitor of fear of the CS in the course of avoidance training. Journal of Comparative Physiological Psychology, 1963, 56, 497-501.

Keutzer, C. and Lichtenstein, E. Modification of smoking behavior: a review. Psychological Bulletin, 1968, 70, 6.

Kimble, G. A. Hilgard and Marquis' Conditioning and Learning. New York: Appleton Century Crofts, 1961.

Kline, M. and Linder, M. Psychodynamic factors in the experimental investigation of hypnotically induced emotions with particular reference to blood glucose measurements. Journal of Psychology, 1969, 71, 21-27.

Kroger, W. S. Clinical and Experimental Hypnosis. Toronto: Lippincott, 1969.

Lashley, K. S. In search of the engram. Symposium in social experimental biology. 4, New York: Cambridge University Press, 1950.

Lawton, M.P. Group methods in smoking withdrawal. Archives of Environmental Health, 1967, 14, 258-265.

Lazarus, A. A. and Abramovitz, A. The use of emotive imagry in the treatment of children's phobias. Journal of Mental Sciences, 1962, 108, 191-195.

LeCron, L. M. (ed.), Experimental Hypnosis. New York: Macmillan, 1952.

Lichtenstein, C., Keutzer, C. and Himes, H. "Emotional" role-playing and changes in smoking attitudes and behavior. Psychological Reports, 1969, 25, 379-387.

London, P. Subject characteristics in hypnosis research, I. A survey of experience, interest, and opinion. International

Journal of Clinical and Experimental Hypnosis, 1961, 9, 151-161.

London, P. Behavior Control. New York: Harper and Row, 1969.

Luce, G. and Sigal, L. Sleep. New York: Coward-McCann, 1966.

Mandler, G. The conditions of emotional behavior. In D. Glass (ed.), Neurophysiology and Emotion. New York: Rockefeller University Press, 1967.

Marmor, J. Psychoanalytic therapy as an educational processes. In J. H. Masserman (ed.), Psychoanalytic Education. New York; Grune and Stratton, 1962.

Marcuse, F. L. Hypnosis Fact and Fiction. New York: Penguin Books, 1959.

Masserman, J. H. Behavior and Neurosis. Chicago: University of Chicago Press, 1943.

Massett, L. Training the autonomic nervous system: Learning to control the uncontrollable. Science News, 1970, 97, 274-275.

McClelland, D. C. Personality. New York: Dryden Press, 1951.

McGaugh, J. L. Facilitation and impairment of memory storage processes. In D. P. Kimble (ed.), The Anatomy of Memory. Palo Alto: Science and Behavior Books, 1965.

Melton, A. W. Implications of short term memory for a general theory of memory. Journal of Verbal Learning and Verbal Behavior. 1963, 2, 1-21.

Menninger, K. A. The Crime of Punishment. New York: Viking Press, 1968.

Mesmer, F. A. Memorie sur la decouverte du magnetisme animal, 1779. Translated as Mesmerism by Doctor Mesmer, with an Introductory monograph by Gilbert Frankau. London: Macdonald, 1948.

Miller, N. E. Fear as an acquired drive. In D. Dulany, R. DeValois, D. Beardslee and M. Winterbottom (eds.), Contributions to Modern Behavior. New York: Oxford University Press, 1963.

Miller, G. A., Galanter, E. and Pribram, K. H. Plans and the Structure of Behavior. New York: Holt, Rinehart and Winston, 1960.

Milner, B. Memory disturbance after bilateral hippocampal lesions. In P. Milner and S. Glickman (eds.), Cognitive Processes and the Brain. New York: VanNostrand, 1965, 97-111.

Morgan, C. Physiological Psychology. New York: McGraw-Hill, 1965.

Moses, F. M. Treating smoking habit by discussion and hypnosis. Diseases of the Nervous System, 1964, 25, 184-188.

Mowrer, H. O. Learning theory and behavior therapy. In B. Wolman (ed.), Handbook of Clinical Psychology. New York: McGraw-Hill, 1965, 242-276.

Ober, D. C. The modification of smoking behavior. Unpublished doctoral dissertation, University of Illinois, 1966.

Olds, J. Pleasure centers in the brain. Scientific American, 1956. 195, 105-116.

Orne, M. On the social psychology of the psychological experiment: with particular reference to demand characteristics and their implications. American Psychologist, 1962, 17, 776-783.

Pattie, F. A. The genuineness of some hypnotic phenomenon. In R. M. Dorcus (ed.), Hypnosis and its therapeutic Implications. New York: McGraw-Hill, 1956.

Paul, G. L. Insight Versus Desensitization in Psychotherapy. Stanford: Stanford University Press, 1966.

Pavlov, I. P. Conditioned Reflexes. New York: Dover, 1927. (Translated by G. V. Anrep.)

Payne, R. W. The role of the clinical psychologist at the institute of psychiatry. Review of Applied Psychology, 1953, 3, 150-160.

Peak, H. Attitude and Motivation. Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1955.

Pfaffman, C. The sensory and motivating properties of the sense of taste. Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1961.

Phillips, E. & Wiener, D. Short-term Psychotherapy and Structured Behavior Change. New York: McGraw-Hill, 1966.

Poverinski, Y. A. Psychotherapy in smoking. In R. B. Winn (ed.), Psychotherapy in the Soviet Union. New York: Philosophical Library, 1961.

Powell, J. and Azrin, N. The effects of shock as a punisher for cigarette smoking. Journal of Applied Behavior Analysis, 1968, 1, 63-71.

Pribram, K. H. Reinforcement revisited: a structural view. Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1963.

Rapaport, D. A critique of Dollard and Miller's "Personality and Psychotherapy". In T. Millon (ed.), Theories of Psycho-Pathology. Philadelphia: Saunders, 1967, 416-420.

Resnick, J. H. Effects of stimulus satiation on the overlearned maladaptive response of cigarette smoking. Journal of Consulting and Clinical Psychology, 1968, 32, 501-505.

Reyher, J. Hypnosis in research on psychopathology. In J. Gordon (ed.), Handbook of Clinical and Experimental Hypnosis. New York: Macmillan, 1967.

Rhodes, R. H. Therapy Through Hypnosis. New York: Citadel Press, 1952.

Rosenberg, M. J. Cognitive reorganization in response to hypnotic reversal of attitudinal affect. Journal of Personality, 1960, 28, 39-63.

Salter, A. What is Hypnosis? New York: Farrar and Straus, 1955.

Sarbin, T. Contributions to role taking theory. I. Hypnotic Behavior. Psychological Review, 1950, 57, 255-270.

Schachter, S. The interaction of cognitive and physiological determinants of emotional state. In L. Berkowtiz (ed.), Advances in Experimental Social Psychology, 1, New York: Academic Press, 1964.

Schachter, S. and Singer, J. E. Cognitive, social, and physiological determinants of emotional state. Psychological Review, 1962, 69, 379-399.

Selye, H. The Physiology and Pathology of Exposure to Stress. Montreal: Acta Incorporated, 1960.

Shor, R. E. and Orne, E. C. Harvard Group Scale of Hypnotic Susceptibility (Form A). Palo Alto: Consulting Psychologists Press, 1962.

Shor, R. E. and Orne, E. C. Norms on the Harvard Group Scale of Hypnotic Susceptibility (Form A). International Journal of Clinical and Experimental Hypnosis, 1963, 11, 39-48.

Siegal, S. Nonparametric Methods for Behavioral Sciences. New York: McGraw-Hill, 1956.

Skinner, B. F. Science and Human Behavior. New York: Free Press, 1965.

Solomon, R. L. and Wynne, L. C. Traumatic avoidance learning: the principles of anxiety conservation and partial reversibility. Psychological Review, 1954, 61, 353-385.

Sourkes, T. L. Biochemistry of Mental Disease. New York: Harper and Row, 1962.

Spence, K. W. Behavior Theory and Learning: Selected Papers. Englewood Cliffs: Prentice Hall, 1960.

Szasz, T. S. The myth of mental illness. American Psychologist, 1960, 15, 113-118.

Taylor, G. R. The Biological Time Bomb, New York: World Publishing Company, 1968.

Thigpen, C. H. and McCleckley, H. Some reflections on psychoanalysis, hypnosis, and faith healing. In J. Wolpe, A. Salter and L. J. Reyna (eds.), The Conditioning Therapies. New York: Holt, Rinehart and Winston, 1966.

Thompson, D. S. and Wilson, T. R. Discontinuance of cigarette smoking: "natural" and with "therapy". Journal of the American Medical Association, 1966, 196, 1048-1052.

Todd, G. F. and Laws, J. T. The reliability of statements about smoking habits. Tobacco Manufacturers Standing Committee Research Paper, Great Britain, 1959 (2nd edition).

Tracy, D. F. How to Use Hypnosis. New York: Sterling, 1952.

Ullmann, L. and Krasner, L. (eds.), Case Studies in Behavior Modification. New York: Holt, Rinehart and Winston, 1964.

Velton, J. and Emmett, A. A laboratory task for the induction of mood states. Behavior Research and Therapy, 1968, 6, 413-482.

vonDedenroth, T. E. A. The use of hypnosis with "tobaccomaniacs". The American Journal of Clinical Hypnosis, 1964, 6, 326-331.

Wallace, R. Brain waves and meditation. Science, 1970, 167, 1-67.

Watson, J. B. and Rayner, R. Conditioned emotional reactions. Journal of Experimental Psychology, 1920, 3, 1-14.

Weitzenhoffer, A. General Techniques of Hypnotism. New York: Grune and Stratton, 1957.

Weitzenhoffer, A. and Hilgard, E. Stanford Hypnotic Susceptibility Scale. California: Consulting Psychologists Press, 1962.

Wells, W. R. Experiments in waking hypnosis for instructional purposes. In M. H. Marx (ed.), Hypnosis in Perspective. New York: Macmillan, 1965.

White, R. W. Comments on the papers by Dr. Rapaport and Dr. Heider. Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1960.

Winer, B. J. Statistical Principles in Experimental Design. New York: McGraw-Hill, 1962.

Wolberg, L. R. Hypnoanalysis. New York: Grune and Stratton, 1964.

Wolpe, J. Psychotherapy by Reciprocal Inhibition. Stanford: Stanford University Press, 1958.

Wolpe, J., Salter, A. and Reyna, L. J. The Conditioning Therapies. New York: Holt, Rinehart and Winston, 1966.

Young, P. T. The role of hedonic processes in motivation. Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1955.

Young, P. T. Motivation and Emotion, New York: Wiley, 1961.

Zanchetti, A. Subcortical and cortical mechanisms in arousal and emotional behavior. In G. Quarton, T. Melnechuk and F. Schmitt (eds.), The Neurosciences a study program. New York: Rockefeller University Press, 1967, 602-614.

Appendix A

Tape-recorded Instructions and Procedures

Experiment 1

Please listen carefully and remember what I say. As you probably know cigarette smoking represents an extreme health hazard. It has been implicated as a causative factor in certain forms of cancer, heart disease, emphysema, hardening of the arteries, and in many other illnesses as well. Therefore, I am sure you will agree it is desirable for you to stop smoking for your own good.

Let me now briefly explain how the smoking habit, or any habit for that matter, can develop and how it can be unlearned.

In general, people learn to do those things that make them feel good and to refrain from those they find unpleasant or which make them feel bad. In the past cigarette smoking was probably often pleasant for you whereas refraining from such behavior may have allowed unpleasant feelings such as anxiety, tension, social unease, or boredom to go unchecked. It is possible by means of the present techniques, and desirable because of the health hazard inherent in smoking, to simply reverse this relationship so that smoking becomes unpleasant whereas the knowledge you are refraining from smoking, and the act of "not smoking", results in pleasant feelings such as satisfaction and contentment.

There is nothing mysterious about how the procedure about to be carried out is able to help an individual achieve such an end. What happens is that that technique can help a person learn to use his own emotions, both pleasant and unpleasant, to automatically reward and punish his own behavior in such a way that he begins to react in a manner that is more desirable and beneficial to him.

In the overall sense this method is completely painless in that an individual who learns to follow this procedure simply stops smoking because it is no longer pleasant to do so. Thus, he no longer has any really compelling reason to do so. At the same time he experiences no unpleasantness when not smoking since he will have learned that the act of "not smoking" automatically causes him to feel quite satisfied, relaxed, and content.

Now I want you to keep on cooperating by continuing to remain quietly with your eyes closed and by complying fully with the instructions to follow. You will find they will cause you to markedly reduce your smoking habit, perhaps, even to the extent of eliminating it completely.

In the future, if you smoke, each time you do so you will feel extremely uncomfortable and anxious and those feelings will become more intense as long as you continue to do so. As soon as you stop smoking you will no longer feel that way. In addition, every time you refrain from smoking, especially on occasions when you are accustomed to doing so, you will feel quite comfortable, relaxed, and satisfied.

Very soon I am going to ask you to imagine yourself smoking a cigarette so you can see for yourself what I have just told you is true. As you imagine yourself smoking you will notice you feel extremely uncomfortable and anxious. Alright, now I want you to imagine yourself smoking a cigarette. As you do so you will notice yourself becoming increasingly more uncomfortable and anxious. (30 second pause.)

Very soon I am going to ask you to imagine you are no longer smoking. When that happens you will notice you feel quite comfortable, relaxed, and satisfied. Alright, until I speak to you again I want you to imagine you have refrained from smoking. Notice you feel quite relaxed, comfortable, and satisfied. (30 second pause.)

Your mind is once again clear and you feel just as you did shortly before I asked you to imagine yourself smoking.

In the future you will continue to react emotionally and automatically to any instance of cigarette smoking which may occur and to any instance in which you refrain from smoking in accordance with the instructions you have just received. As a consequence you will smoke less often than you have in the past, and you may no longer desire to smoke at all.

On approximately five nights of each week for the next six weeks you will have a brief dream sometime during your normal period of sleep. In these dreams you will remind yourself to carry out all instructions you have just received about smoking and you will experience the appropriate emotions in response to smoking and refraining from it. Because persons do not always remember their dreams, upon awakening you may not

recall having had one. Nevertheless, you can be quite certain that you did and that it will help you reduce your smoking habit.

"Expectancy Instructions" to Waking Groups

It has been found that if a subject is given instructions by a hypnotist immediately following a hypnotic session he can carry them out just as effectively as when given those instructions while still hypnotized. Therefore, I am now going to present you with a set of instructions and even though you will remain fully awake and not become hypnotized you will find that you will be able to carry them out completely just as if they had been administered to you under hypnosis. The instructions will follow shortly.

Now please close your eyes but remain fully awake and continue to listen carefully.

Experiment 2

Cognitive Instructions

Every day for the next twenty days you will consume at least several life saver lozenges of the type I am soon going to present to you.

Affective Instructions

Every time during the next twenty days that you ingest a life saver lozenge of the type I am soon going to present to you, you will immediately experience a comfortable, relaxed, satisfied, and slightly exhilerating feeling. This will be true each time you consume a life saver but it will only be true for the next twenty days and no longer.

I am not suggesting that you must eat life savers during the next twenty days. That is entirely up to you. If, however, you do, each time you do you will automatically and immediately experience the feelings just stipulated.

Very soon I am going to ask you to imagine yourself consuming a life saver. When you do you will feel comfortable, relaxed, satisfied, and slightly exhilerated. Alright, now I want you to imaging you are consuming a life saver. Notice that you feel exactly as I told you you would. (30 second pause.)

Now I no longer want you to imagine you are eating a life saver. Notice that the comfortable, relaxed, satisfied, and slightly exhilerating feeling is disappearing and will soon be completely gone (30 second pause.)

Your mind is once again clear and you feel just as you did shortly before I asked you to imagine yourself eating a life saver.

Reinforcement Instructions

On approximately five nights a week for the next twenty days you will have a brief dream sometime during your normal period of sleep. If you have just received instructions about life savers, in those dreams you will remind yourself to carry them out. Because persons do not always remember their dreams upon awakening you may not recall having had one. Nevertheless, you can still be quite certain that you did.

Instructions about trying to break the life saver habit

Beginning ten days from today I want you to try to abstain from eating life savers. I want you to continue to do so for the following ten days. The period in question corresponds to days eleven through twenty on the record form I am going to present to you.

Experiment 3

Positive Emotion Instructions

I am soon going to turn on the yellow light that is sitting on the table near you. When I do you will notice that you gradually begin to feel quite content, satisfied, and slightly

exhilerated. These feelings will continue to increase in intensity as long as that light remains on. Anytime you are in this room today and the yellow light is on you will experience similar feelings, but they will disappear as soon as it is turned off.

I am now going to turn on the yellow light. (The yellow light is turned on.) Notice that you are beginning to feel quite content, satisfied, and slightly exhilerated.

Now I am going to turn off the yellow light. When I do you will notice that the feelings of contentment, satisfaction, and exhileration immediately disappear. (The light is turned off and there is a 30 second pause.)

You now feel as you did just before the yellow light was turned on.

Negative Emotion Instructions

(These instructions were the same as those given subjects in the positive emotion groups except that the words content, satisfied, and exhilerated were replaced by the words uncomfortable, anxious, and irritable.)

Amnesia Instructions

If you have been instructed to experience particular feelings whenever the yellow light sitting on the table near you is on, you will do so immediately at such times. At such times you will not realize, however, that the yellow light is responsible for those feelings.

"No Amnesia" Instructions

(These instructions were the same as those given subjects in the amnesia groups except that the words not and however were omitted from the last sentence.)

Appendix B

Major Statistical Procedures and Raw Data

Experiment 1

Table 19

Newman-Keuls test of differences between groups

Group	70.25 HYP-HI	98.93 WAKE-HI	105.06 CONTROL-LO	109.65 CONTROL-HI	109.06 -HYP-LO	112.45 -WAKE-LO
HYP-HI	--	860.4**	1044.3**	1182.0**	1191.3**	1266.0**
WAK-HI	--	--	183.9	321.6	330.9	405.6
CON-LO	--	--	--	137.7	147.0	211.7
CON-HI	--	--	--	--	9.3	84.0
HYP-LO	--	--	--	--	--	74.7
WAK-LO	--	--	--	--	--	--
Truncated r		2	3	4	5	6
q .99 (r.173)		3.64	4.12	4.40	4.60	4.76
		419.15	474.42	506.67	529.67	548.12

** Significant at .01 level.

Table 20

Chi square test between reported emotions and decreases in smoking

	Reported Emotions	Did Not Report Emotions	
Decrease	8	0	
No Decrease	0	12	

$$\text{Chi Square} = \frac{(ad-bc-N/2)^2 \cdot N}{(a+c)\,(b+d)\,(a+b)\,(c+d)} = \frac{147920}{9428} = 15.9 \quad df=1 \quad p < .01$$

Experiment 2

Table 21

Analysis of Variance Summary Table

Source	SS	df	MS	F
between		59		
Type of Treatment (A) (Hyp. vs. control vs. Wake)	8254.02	2	4127.01	13.45**
Affect. vs. Cognitive (B)	72.00	1	72.00	.23
Interaction (A·B)	150.44	2	75.22	.24
Reinforce vs. not Reinf. (C)	166.73	1	166.73	.54
Interaction (C·A)	314.27	2	157.13	.51
Interaction (C·B)	126.02	1	126.02	.41
Interaction (C·A·B)	63.65	2	31.82	.10
Error I	14722.56	48	306.72	
within		300		
Periods	23206.49	2	11603.24	103.50**
Trials	1992.67	1	1992.67	17.70**
Error 2	26901.83	240	112.09	
Total		359		

** Significant at .01 level

Table 22

Duncan's range test between Hypnotic, Waking, and Control Groups during Period 1

Group	1225 Hypnotic	1011 Waking	353 Control
Hypnotic	--	214*	872*
Waking	--	--	658*
Control	--	--	--
Truncated r		2	3
q.95 (r.240)		185.48	195.52

* Significant at .05 level.

Table 23

Dunnett Tests between Control and Treatment Groups during Period 2

WAK AFFECT vs. Control	$t = \frac{9.35-0}{\sqrt{2\ MSerror/20}} = \frac{9.35}{3.34}$	= 2.79*
HYP-COG. vs. Control	$t = \frac{9.50}{3.34}$	= 2.88*
HYP.-Affect vs. Control	$t = \frac{11.3}{3.34}$	= 3.38*
WAKE-COG. vs. Control	$t = \frac{12.35}{3.34}$	= 3.70*

*Significant at .05 level.

Table 24

Newman-Keuls test among Periods for Hypnotic Subjects

	1225 Period 1	416 Period 2	93 Period 3
Period 1	--	809*	1132*
Period 2	--	--	323*
Period 3	--	--	--
Truncated r		2.77	3.31
q.95		184.48	221.64

*Significant at .05 level.

Table 25

Newman-Keuls test among Periods for Waking Subjects

	1101 Period 1	434 Period 2	133 Period 3
Period 1	--	577*	587*
Period 2	--	--	301*
Period 3	--	--	--
Truncated r		2.77	3.31
q.95		185.48	221.64

* Significant at .05 level.

Table 26

Duncan Test among Reinforced, Not Reinforced, and Control Groups during Period 1

	1119 Reinforced	1117 Not Reinforced	353 Control
Reinforced	--	2	766*
Not Reinforced	--	--	764*
q.95		185.48	195.52

* Significant at .05 level

Experiment 3

Table 27

Analysis of Variance Summary Table from Question 1

Source	SS	df	MS	F
EMT	9172.26	2	4586.13	5.93**
HYP	117.59	1	117.59	.15
EMT.HYP	3429.89	2	1714.95	2.22
AMN	166.66	1	166.66	.21
EMT.AMN	905.83	2	452.91	.58
HYP.AMN	187.26	1	187.26	.24
EMT.HYP.AMN	2846.22	2	1423.11	1.84
Error	37097.35	48	772.86	

**Significant at .01 level.

Table 28

Analysis of Variance Summary Table from Question 2

Source	SS	df	MS	F
EMT	21863.50	2	10931.75	14.79**
HYP	459.26	1	459.26	.62
EMT.HYP	1487.03	2	743.51	1.01
AMN	516.26	1	516.26	.70
EMT.AMN	4264.62	2	2132.31	2.89
HYP.AMN	1008.59	1	1008.59	1.36
EMT.HYP.AMN	412.29	2	206.14	.28
Error	35476.95	48	739.10	

**Significant at .01 level.

Table 29

Analysis of Variance Summary Table from Question 3

Source	SS	df	MS	F
EMT	37187.53	2	18593.76	17.74*
HYP	104.02	1	104.02	.10
EMT.HYP	832.13	2	416.06	.40
AMN	183.75	1	183.75	.17
EMT.AMN	284.39	2	142.19	.14
HYP.AMN	1411.35	1	1411.35	1.35
EMT.HYP.AMN	1465.59	2	732.79	.70
Error	50288.88	48	1047.68	

**Significant at .01 level.

Table 30

Analysis of Variance Summary Table from Question 4

Source	SS	df	MS	F
EMT	54907.79	2	27453.89	24.68**
HYP	570.42	1	570.42	.51
EMT.HYP	156.23	2	78.12	.07
AMN	183.75	1	183.75	.16
EMT.AMN	985.89	2	492.95	.44
HYP.AMN	54.15	1	54.15	.05
EMT.HYP. AMN	564.70	2	282.35	.25
Error	53400.58	48	1112.50	

** Significant at .01 level.

Table 31

Anaylsis of Variance Summary Table from Question 5

Source	SS	df	MS	F
EMT	59967.39	2	29983.69	28.86**
HYP	117.60	1	117.60	.11
EMT.HYP	1672.30	2	836.15	.80
AMN	166.66	1	166.66	.16
EMT.AMN	508.23	2	254.11	.24
HYP.AMN	365.06	1	365.06	.35
EMT.HYP.AMN	1702.02	2	851.01	.82
Error	49865.69	48	1038.86	

** Significant at .01 level.

Table 32

Dunnett tests between Positive Emotion, Control, and Negative Emotion Groups

Question 1		
Control vs. Positive Emotion:	$t = \frac{20.35}{3.93}$	= 5.18**
Control vs. Negative Emotion	$t = \frac{9.25}{3.93}$	= 2.35*
Question 2		
Control vs. Positive Emotion:	$t = \frac{24.15}{3.84}$	= 6.28**
Control vs. Negative Emotion	$t = \frac{22.60}{3.84}$	= 5.88**
Question 3		
Control vs. Positive Emotion	$t = \frac{24.40}{4.58}$	= 5.33**
Control vs. Negative Emotion	$t = \frac{36.20}{4.58}$	= 7.90**
Question 4		
Control vs. Positive Emotion	$t = \frac{21.45}{4.71}$	= 4.55**
Control vs. Negative Emotion	$t = \frac{50.70}{4.71}$	= 10.75**
Question 5		
Control vs. Positive Emotion	$t = \frac{18.25}{4.55}$	= 4.00**
Control vs. Negative Emotion	$t = \frac{56.05}{4.55}$	= 12.30**

*Significant at .05 level.

** Significant at .01 level.

Table 33

Analysis of Variance Summary Table from Summed Scores

Source	SS	df	MS	F
EMT	829204.00	2	414602.00	28.73**
HYP	1233.05	1	1233.05	.08
EMT.HYP.	21684.07	2	10842.03	.75
AMN	2356.24	1	2356.24	.16
EMT.AMN	12417.67	2	6208.83	.43
HYP.AMN	11985.02	1	11985.02	.83
EMT.HYP.AMN	28336.48	2	14168.24	.98
Error	692695.26	48	14431.15	

** Significant at .01 level.

Table 34

t-test between Hypnotic, Negative Emotion, Amnesia and Hypnotic, Negative Emotion, No Amnesia Groups

$$t = \frac{330.2 - 186.0}{75.97} = \frac{144.2}{75.97} = 1.89^*$$

* Significant at .05 level.

Table 35

Duncan Tests among Hypnotic, Waking, and Control Groups

Positive Emotion:	Control	Waking	Hypnotic
Control	--	1686*	1950*
Wake	--	--	264
Negative Emotion:			
Control	--	625	1252*
Wake	--	--	627
Truncated r		2	3
q.95		1072.66	1139.65

* Significant at .05 level.

Table 36

Raw data from Experiment 1.

		Subjects	Pre-Treatment						Post-Treatment					
Hypnotic	High	TBK (10)	55	54	63	38	37	51	15	40	14	37	32	45
		LEE (9)	70	76	86	65	54	58	32	38	40	44	41	38
		DCI (9)	120	134	132	142	135	134	29	50	79	109	123	160
		BOG (8)	150	145	140	150	141	168	98	106	98	106	105	100
		DHG (8)	160	130	122	132	123	133	95	89	84	81	109	57
	Low	JLE (3)	157	126	131	121	116	130	108	114	106	138	112	118
		RMA (3)	90	78	89	106	98	89	116	102	101	123	110	90
		MOO (3)	82	73	72	81	94	90	90	78	69	75	88	86
		MJN (4)	112	113	114	110	114	111	116	125	115	118	122	124
		VRY (1)	115	125	124	125	136	134	128	125	121	132	145	147
Control	High	WNH (8)	126	100	119	138	140	133	143	149	136	134	145	151
		AAL (8)	79	84	69	81	71	85	73	72	76	68	74	78
		DLE (9)	107	100	89	100	110	106	109	105	115	106	110	110
		ELK (10)	88	95	73	70	88	93	82	90	65	64	81	88
		PTO (8)	120	121	114	110	136	143	125	126	115	103	133	142
	Low	TSI (2)	85	74	78	69	82	59	75	103	63	60	60	60
		SLE (3)	143	147	132	135	138	119	141	139	122	127	137	114
		NYR (3)	98	92	96	97	91	99	101	94	95	86	91	84
		LAN (4)	120	114	132	132	119	107	112	115	130	125	114	120
		JRK (2)	128	121	130	132	120	118	137	129	120	134	129	128
Waking	High	GPS (8)	48	45	46	35	45	57	6	18	13	29	55	39
		DNR (8)	116	118	123	116	110	124	142	129	123	137	135	135
		NOU (9)	147	143	130	140	129	139	131	122	123	120	112	120
		HPA (9)	66	110	115	95	128	111	42	100	82	59	111	105
		DRE (10)	87	78	92	115	110	105	113	103	91	94	99	95
	Low	SLO (2)	144	151	155	158	163	160	199	202	204	207	205	206
		RRN (2)	218	244	119	205	210	219	207	229	232	218	205	212
		SNE (3)	118	126	124	114	129	119	112	120	120	110	120	110
		DWE (3)	39	44	44	48	44	38	38	36	35	44	33	41
		KER (4)	40	27	31	41	22	5	16	29	26	30	10	1

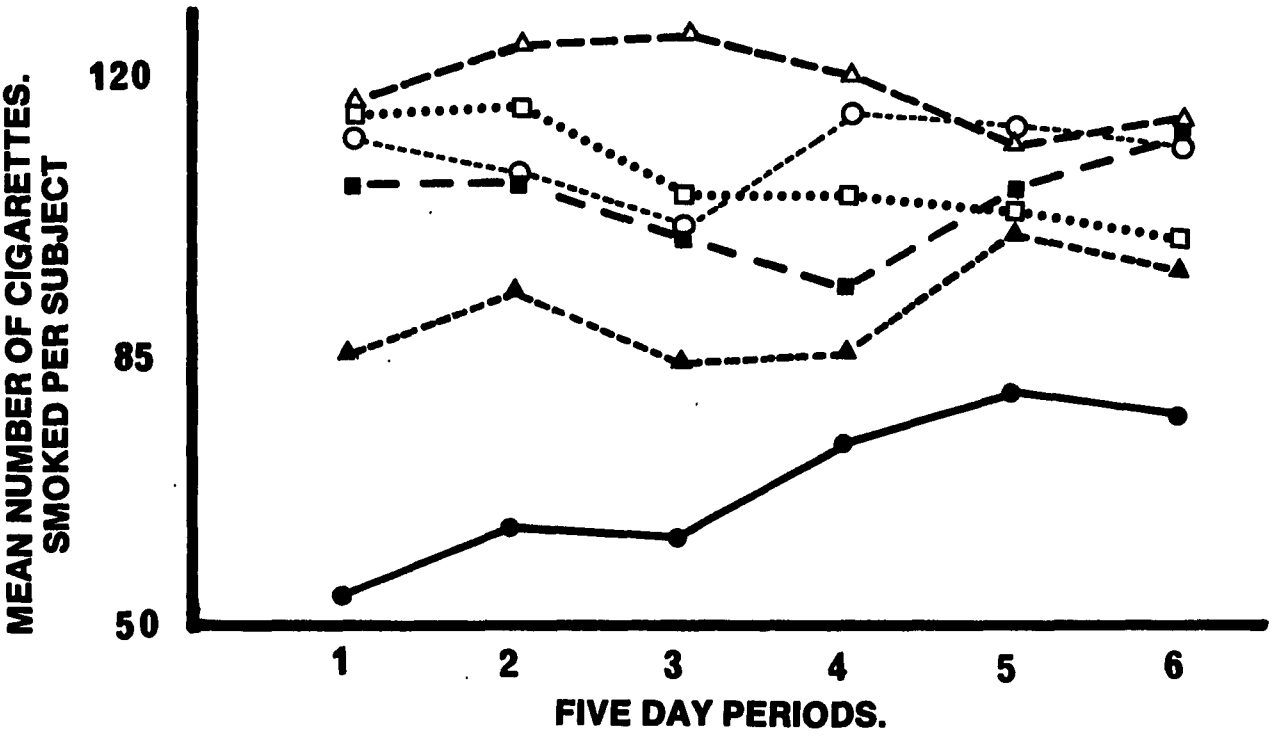

Figure 7. Unadjusted post-treatment scores from Experiment 1. (See Figure 4 for key to groups.)

Table 37. Raw data from Experiment 2.

Hypnotic Groups	Affective	Reinforced	BAN	(12)	50	10	0	0	0	0
			TFE	(8)	32	0	13	0	0	0
			VRW	(11)	24	23	17	10	12	2
			SSE	(9)	78	24	0	0	0	0
			TDA	(8)	39	65	14	16	2	0
		Not Reinforced	RMN	(11)	8	7	7	9	3	1
			JOO	(10)	60	67	41	2	0	0
			RRT	(10)	10	20	30	20	10	10
			WCT	(8)	72	48	21	12	9	0
			JTL	(8)	12	5	2	6	7	18
	Cognitive	Reinforced	PSS	(11)	30	12	20	11	0	0
			NCK	(11)	50	19	0	0	0	0
			JLO	(10)	18	14	8	8	1	0
			LYE	(8)	56	12	13	17	12	2
			CCK	(8)	12	10	0	0	0	0
		Not Reinforced	MIS	(11)	17	9	16	10	0	0
			JDA	(8)	53	32	31	17	0	0
			SHN	(10)	29	20	0	0	1	0
			LHE	(9)	72	36	14	0	0	0
			BKE	(8)	38	32	18	17	7	6
Control Groups	Affective Control	Reinforced	KLL	(8)	49	12	0	0	0	12
			STS	(11)	23	10	0	0	18	0
			PWO	(8)	2	0	0	0	0	0
			DEA	(10)	2	0	0	0	0	0
			BBL	(9)	1	0	0	0	8	0
		Not Reinforced	LJN	(8)	3	0	0	0	0	0
			PER	(10)	5	0	0	0	0	0
			RRX	(8)	30	23	0	0	3	4
			EAN	(9)	4	0	0	0	0	21
			MYN	(8)	14	10	0	0	0	0
	Cognitive Control	Reinforced	JLE	(10)	2	0	0	0	0	0
			GRA	(8)	1	34	0	0	0	0
			JCE	(8)	3	0	0	0	0	0
			AHO	(10)	14	4	0	0	2	16
			BDR	(9)	22	3	0	0	2	0
		Not Reinforced	SKS	(8)	22	1	0	0	0	3
			COR	(10)	1	0	0	0	0	0
			SIF	(8)	1	0	0	0	3	6
			PMN	(11)	21	35	0	0	2	0
			MML	(9)	1	0	0	0	0	0
Waking Groups	Affective	Reinforced	SWI	(10)	8	5	0	0	0	0
			CME	(8)	53	43	40	0	0	12
			SGD	(8)	10	2	0	0	0	0
			PMO	(11)	72	48	0	12	0	0
			MMM	(8)	35	18	31	20	0	0
		Not Reinforced	JRO	(8)	54	39	11	8	4	1
			BTS	(10)	27	25	13	4	8	4
			BER	(11)	34	0	13	0	17	9
			LTE	(8)	27	2	7	16	3	0
			GOR	(8)	9	12	10	2	0	0
	Cognitive	Reinforced	DBN	(11)	47	36	29	34	14	8
			MSN	(8)	40	14	9	0	0	0
			KTH	(10)	17	3	0	0	0	0
			MRL	(9)	25	22	1	0	0	0
			GWC	(8)	22	21	12	8	0	0
		Not Reinforced	JBD	(10)	30	40	15	12	15	13
			BTR	(10)	52	13	37	34	3	9
			STU	(10)	30	28	5	0	0	0
			EAE	(9)	2	0	0	0	0	0
			BKR	(8)	28	18	34	17	12	1

Table 38. Raw data from Experiment 3.

Positive Emotion	Hypnotic	Amnesia	BMH	(12)	126	125	126	102	126
			FRS	(8)	138	115	114	113	113
			ADR	(11)	126	102	102	77	123
			SEL	(9)	126	127	152	126	152
			DES	(8)	126	102	152	61	126
		No Amnesia	MST	(11)	152	152	152	76	127
			WOD	(10)	152	126	152	102	102
			LOR	(10)	79	112	89	60	136
			STT	(8)	90	110	101	86	101
			HEN	(8)	126	126	126	114	138
	Waking	Amnesia	MOR	(8)	126	152	152	152	152
			HUH	(10)	152	152	127	102	112
			TMN	(9)	102	75	127	81	130
			WIS	(11)	101	75	75	52	49
			KIL	(9)	75	101	126	126	126
		No Amnesia	MTS	(10)	101	126	126	102	126
			NER	(8)	75	75	75	51	152
			SHS	(9)	101	126	152	152	126
			TAY	(8)	131	133	126	126	141
			COT	(8)	126	101	101	75	75
No Emotion Groups	Hypnotic Control	Amnesia	STZ	(10)	89	63	75	1	25
			BAK	(10)	86	110	101	18	40
			RHE	(9)	141	86	92	65	86
			CAE	(9)	75	75	75	24	25
			ALR	(8)	134	135	114	109	118
		No Amnesia	YDO	(11)	133	80	56	2	69
			SIG	(9)	75	75	75	25	53
			LOW	(8)	100	75	101	75	75
			KAJ	(8)	101	126	127	75	102
			HTR	(10)	87	59	88	37	82
	Waking Control	Amnesia	HAC	(8)	75	101	100	51	51
			NOB	(12)	51	75	75	0	26
			TOP	(8)	108	128	130	104	123
			GAS	(8)	82	106	15	10	31
			LEH	(10)	101	126	126	75	75
		No Amnesia	CAH	(8)	101	75	75	25	25
			MOR	(9)	101	75	75	25	25
			DET	(9)	111	75	101	50	50
			HLT	(8)	37	59	13	32	38
			PNY	(10)	136	131	115	93	92
Negative Emotion Groups	Hypnotic	Amnesia	SEN	(11)	75	51	75	0	0
			FYF	(11)	75	65	25	0	26
			MON	(10)	75	0	51	25	25
			CLK	(8)	1	35	25	26	76
			YOR	(8)	75	50	50	4	20
		No Amnesia	BAZ	(8)	126	75	27	75	51
			LEW	(11)	125	125	125	35	53
			HIL	(9)	75	60	52	1	26
			RAN	(8)	75	50	50	4	24
			IKR	(8)	75	101	101	75	75
	Waking	Amnesia	BSK	(11)	99	73	50	74	55
			RON	(8)	151	77	97	2	138
			SIH	(10)	75	56	85	1	68
			EAL	(9)	106	75	75	16	24
			EAS	(9)	75	75	75	26	26
		No Amnesia	MAH	(9)	80	60	32	13	32
			ARD	(10)	90	88	83	10	30
			STR	(10)	136	137	111	87	87
			TLK	(10)	75	50	51	4	56
			SES	(8)	75	75	1	25	26

Appendix C

Questionnaires

ANSWER THE FOLLOWING BY CIRCLING EITHER YES OR NO, OR BY WRITING IN THE REQUESTED INFORMATION, AND THEN PLEASE RETURN THIS FORM TO THE EXPERIMENTER IN THE ENCLOSED ENVELOPE.

1. When instructed during your last experimental session to experience emotions were you able to do so? YES NO

2. When rating the musical tune at the conclusion of your last experimental session and the yellow light was turned on were you aware of experiencing any particular feelings? YES NO

3. When the yellow light was turned on, at that time did you remember having been told that when it was on it would cause you to experience certain emotions? YES NO

4. Why do you feel you rated the tune as you did? Was it because you wanted to please the experimenter and felt he wanted you to rate it that way or was it for other reasons? Please explain.

5. Please use the following space, as well as the back of this questionnaire, to make any comments you feel might be of interest. I am particularly concerned with knowing whether, during the past few weeks, you experienced any emotions suggested to you and whether you felt compelled to comply with any suggestions you may have received. Do you feel you remember all that went on during your hypnotic session, and do you feel you have responded well to any suggestions presented? If there were any you were not able to comply with please explain if possible. Thank you.

Signature: _____

Note. - The above form, with the exception of the last four sentences, was sent to subjects who participated in the third study. Questions 2, 3 and 4 were omitted on the questionnaires sent to subjects in the first experiment. Only statement 5 appeared on the questionnaires administered subjects in Experiment 2.

Appendix D

Evaluation Form from Experiment 3

DRAW AN X ON EACH OF THE FIVE LINES TO INDICATE YOUR ANSWER

1. The ability of the instrumental lead in this recording was:

1 2 3 4 5 6 7

poor average excellent

2. The melody was:

1 2 3 4 5 6 7

poor average excellent

3. My evaluation of the musical accompaniment is that it was:

1 2 3 4 5 6 7

poor average excellent

4. Likelihood that I would buy this record:

1 2 3 4 5 6 7

definitely not 50% definitely

5. If given this recording I would play it:

1 2 3 4 5 6 7

never rarely often very often

_____

Appendix E

Implications

The present discussion is intended to consider some implications of the preceding experiments and theoretical conceptualizations.

Results of the third study were significant in their implications about how emotions influence attitudes and decisions. For example, assume that instead of being asked to rate the music subjects had been required to evaluate a political speech and to vote for, or against, the speaker. Assume also that the eliciting emotional stimulus had been a function of the speaker's appearance, the length of his hair, his marital status, and so on instead of a function of the yellow light. If behaviors in that situation proved analogous to those in the third experiment, this would clearly be significant.

Results of the third study suggested that advertisers who attempt to gain exposure for their products by associating them with particular feelings (such as those of sexual competence) may sometimes be taking a wise approach in terms of their own immediate self interests. This is so because subjects' responses in that experiment suggested that persons may sometimes be biased towards favorably evaluating and purchasing products (such as a musical recording) that are associated with the elicitation of positive feelings.

The third experiment indicated that emotions can affect attitude development and change. Probably many a mundane orator could take a lesson from that principle. Apparently two persons can sometimes say the same thing, yet how their views are accepted may depend, at least partially, upon how one <u>feels</u> when listening to the speaker.

Attitudes need not always be primarily a function of emotional factors. Instead, the third study showed one way that cognitive content can act in this connection, and this experimental finding can be paralleled by numerous examples. Even though the present studies dealt more with emotional functioning (and disfunctioning) than with thinking (or thought disorders), one should not minimize the importance of cognitive factors in influencing opinion change (London, 1961; Harper, Anderson, Chirstensen, & Hunka, 1964; Coch & French, 1960) and in effecting

virtually the entire spectrum of human behavior (Miller, Galanter, & Pribram, 1960). The present discussion is not intended as a comprehensive statement about attitude development and many factors other than the somewhat specific types of cognitive-emotional interactions dealt with in the third study (including the phrasing and timing of the speaker's presentation) can be important in this connection. Further discussion of these matters is well beyond the scope of the present paper.

The third experiment suggested that emotions can affect behavior in spite of cognitive information that they are irrelevant. This suggests several implications about behavioral control.

Mitigating circumstances can exist when persons act because of physical coercion by others. The present experiments suggest that people can also be driven to "antisocial" activity to try to avoid the unpleasantness of their own internally precipitated feelings. Since it is established that persons differ in temperment, sexual desires, exposure to circumstances, and so on it is likely more difficult for some individuals (even though they can cognitively discriminate "right" from "wrong") to do "right" than it is for others. This is so because, undoubtedly, some have to try harder than others to bring their emotions, and associated behaviors, under control.

The present studies are based upon theory that is essentially hedonic in nature (eg., Young, 1961; Pribram, 1963; Helson, 1959; Olds, 1956; Pfaffman, 1961; Peak, 1955; McClelland, 1951). According to this view even unselfish behaviors are a function of emotional factors and, thus, amenable to change by extensions of the current techniques. Many behaviors besides those dealt with here involve emotional concommitants. These can undoubtedly change and interact, both consecutively and concurrently, resulting in a great variety of activity (Fowler, 1965). Differing degrees of cognitive involvement may influence these behaviors and a task for future research will be to determine the conditions under which a particular stimulus will be cognitively registered.

Appendix F

Some Theoretical Considerations

The methods for changing behavior demonstrated here are predicted upon assumptions concerning the determinants of human activity. The present discussion is intended to take note of some of those determinants in order to present a theoretical framework to which the methods demonstrated can be related.

A primary determinant of behavior insofar as the three experiments presented were concerned is emotionality. Emotions can be aroused in several ways. They can be elicited as a consequence of partially unlearned psychological processes. Cognitive dissonance (Festinger, 1957) and reacting emotionally to the death of a loved one might be examples. They can be aroused in response to environmental or biological stimuli, and eliciting agents in this category would include drugs, cellular fatigue, certain visual configurations, and so on. Emotions can also be aroused as a result of classical conditioning (Young, 1955). Another way of arousing emotions is by hypnosis (Salter, 1955).

Other factors besides emotions can help regulate behavior. Some behavior can involve reflexes or tropisims. Other activity, both physiological and overt, may involve a series of associative responses (Dethier, 1961). Lashley (1950) suggested, for example, that once a person begins typing a phrase his behavior may temporarily proceed as a unit independent of his immediate control. "Automatic walking" as occurs in decorticated animals (Gardner, 1963) is associative in nature and when a person drives a car over a familiar road, or lights up a cigarette, he may be performing a noncognitive associative activity. The extent to which behavior is cognitively mediated is a matter of degree with the simplest noncognitive reflexes occurring at one extreme. Many emotionally mediated behaviors may ultimately become essentially associative (Kamin et a., 1963).

Emotions may directly affect performance rather than learning. Learning involves recording and retaining information (Melton, 1963), whereas performance is what a person does in response to that information. Most therapists tacitly assume that learning mechanisms are intact when attempting to alter psychological performance (White, 1960). Even behavior therapy fails to directly affect learning mechanisms. Instead, it structures the situation so that learning can occur.

Learning may take place primarily as a function of selective recording of contiguous events, and permanent loss of learned information corresponds to forgetting (McGaugh, 1965; Milner, 1965). Emotions may bias particular responses to be repeated more or less often in contiguity with particular eliciting stimuli thereby leading to preferential strengthening of specific learned associations (Pribram, 1963). Much human behavior is undoubtedly associative performance rather than being solely a function of new learning. Other processes, too, such as arousal, concentration, sensing, and so on also affect behavior.

Learned information appears to be stored in a fashion that is independent of specific phrasing or verbal content, and is capable of leading to "goal directed" activities.

External representations are transmitted to the brain as energy in the form of electrochemical potentials. Since it is these representations which reach the brain individuals can be rewarded only by mechanisms dependent upon the activity of their bodies biological systems. In terms of the present formulation, this would be by their emotions. Thus, persons may be equipped by way of genetically established associative feedback mechanisms to stop performing responses resulting in negative affect and to continue to perform responses followed by positive feelings.

Psychologically a person is his own feelings and thoughts and they are distinct from him only in the same sense that his organs, tissues, cells, and so on can be conceived of as both separate and inseparable form his physical whole. If the cells of a person's brain responsible for helping support his thought processes were to be damaged his body might still exist as a physical reality to others but self awareness might be impaired and in terms of experiencing a mental existence he might then be psychologicaly deceased.

The present discussion has highlighted only a few concepts of relevance to behavioral research. Much has of necessity been omitted.

Epilogue

Man is by nature complex. The ideas and experiments presented here have attempted to partially reduce the diversity of human experience to a series of basic principles. In so doing they still allow one to appreciate and respect the magnitude of that complexity.